ADVANCED GEOGRAPHY

McMURRY
AND
PARKINS

THE MACMILLAN COMPANY

This book belongs to
Mrs. Dorothy Rodrigues

ADVANCED GEOGRAPHY

TABLE OF CONTENTS

(Numbers in parentheses indicate pages on which maps occur; such numbers followed by asterisks indicate more detailed maps for reference rather than study.)

PAGE

PART I. NORTH AMERICA (2, 3)

I. The Story of Our Continent 1
II. Life upon the Continent 13
III. Principal Peoples of North America . 20
IV. The United States (14–15, 26–27, 474*–475*) 24
1. The Northeastern States (38–39, 478*) 29
2. The North Central States (74–75, 479*) 62
3. The Southern States (102–103, 474*–475*) 94
4. The Western States (154–155, 474*–475*) 129
V. Territories and Dependencies of the United States (470–471) 167
1. The Territory of Alaska (182–183) . 167
2. The Territory of Hawaii (434) . . 173
VI. Canada and Newfoundland 175
1. Canada (182–183) 175
2. Newfoundland (182–183) 188
VII. Countries South of the United States . 190
1. Mexico (194–195) 190
2. West Indies (194–195) 200
3. Central America (194–195) . . . 204
VIII. Review of North America 208
1. Extent of Our Natural Resources 208
2. The Conservation of Our Resources 215

PART II. GENERAL GEOGRAPHY

I. The Earth (470–471) 225
II. Latitude, Longitude, and Standard Time 228
1. Latitude and Longitude 228
2. Standard Time (214) 230
III. Winds and Rainfall 232
1. Winds (234) 232
2. Rainfall (234) 234
IV. Distribution of Temperature 240
V. Ocean Currents (242) 241

PART III. SOUTH AMERICA (246–247)

I. General Facts 245
II. Tropical South America 252
1. Brazil and the Guianas (250) . . . 252
2. The Northern Andean Countries (260) 258

PAGE

III. Temperate South America (269) . . . 266

PART IV. EUROPE (280, 281)

I. General Facts 279
II. Northwestern Europe (300–301, 482*–483*) 288
1. British Isles 289
2. France 306
3. Germany 318
4. Switzerland 330
5. Belgium, The Netherlands, and Denmark 337
6. Norway and Sweden 344
III. Eastern Europe (280, 281) 349
IV. Countries of the Western Mediterranean (368, 486*) 359
1. Spain and Portugal 359
2. Italy 364
V. The Countries of the Danube and the Balkans (369, 487*) 374

PART V. ASIA (384, 385)

I. General Facts 383
II. Southwestern Asia (391) 388
III. Central and Northern Asia (384, 385) . 397
IV. India and Ceylon (391) 401
V. The Far East (411) 409
1. The Chinese Republic 409
2. The Japanese Empire 420
VI. Southeastern Asia and the East Indies (384, 385, 411, 434, 439) 426

PART VI. AUSTRALIA, NEW ZEALAND, AND THE ISLANDS OF THE PACIFIC (438, 439) 437

PART VII. AFRICA (450, 451) 447

PART VIII. THE UNITED STATES IN COMPARISON WITH OTHER COUNTRIES (470–471) 466

APPENDIX 477
INDEX 489

(For detailed reference maps of densely populated regions, see Appendix.)

PART I. NORTH AMERICA

I. The Story of Our Continent

Some of the changes in our continent, and how we know about them. — It is supposed that the Indians first reached North America by crossing Bering Strait from Asia, and that from Alaska they gradually spread over the entire continent. They must have lived here many, many hundreds of years before the white men came.

The long ages required for such changes

Since their first appearance on the continent, it is certain that its outline and surface features have remained very nearly the same. The rivers have cut their valleys and changed their courses slightly, some lakes have been dried up or reduced to marshes, and the coast line has been somewhat altered. Yet, if the first Indians who came here had made as accurate maps as we now make, a comparison of such maps with ours would show exceedingly slight changes.

Nevertheless, the continent has not always been as it is to-day. Areas that are now land have once, or even several times, been under the sea; areas that are now beneath the sea were once land; where now there are plains, lofty mountains once stood; and some of our plateaus were once low plains. The fact that the continent has changed so slightly during the many hundreds of years since the arrival of the Indians suggests what ages it must have required to bring about these enormous changes. Certainly it took a very long period of time.

How do we know these facts? They have been learned by a careful study of the rocks and surface features. Although many questions can be asked that no man is yet able to answer, the outline of the story of our continent is fairly well known.

Many times the sea has covered a large part of the continent. Wherever there is a sea, material is being deposited along its edges as sand, mud, or ooze. Can you suggest where it comes from? These deposits — called sediment — gradually harden into rock, forming sandstone, shale, or limestone, which are very common. Since these rocks are formed from sediment, they are called *sedimentary* rocks.

How certain kinds of rock have been formed, and their distribution

Fig. 3 shows the distribution of the sedimentary rocks of North America, where they appear at or near the surface of the earth. Their presence in any area indicates that that area was once beneath the sea. How much of the whole surface of

---

Questions on Fig. 1. — 1. Find out from Fig. 215 where the Panama Canal is situated. Could this canal have been dug if the elevation of the Isthmus of Panama were such as to be shown in brown on this map? Point out on this map two other possible routes for a canal joining the Pacific and Atlantic oceans. 2. Trace a route lying entirely through lowlands from the Gulf of Mexico to the Arctic slope. 3. Do you estimate that more or less than half the area of North America has a greater elevation than 2,000 feet? 4. Does any statement on p. 9 help to explain why it is that Greenland is shown here in brown?

NORTH AMERICA
PHYSICAL MAP
Scale of statute miles
0 100 200 400 600 800 1000
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
Below sea level
DEPTHS IN FEET
Sea level to 600
Below 600
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
CARIBBEAN SEA
GREENLAND
HUDSON BAY
ROCKY MOUNTAINS
GREAT PLAINS
GREAT BASIN
CENTRAL PLAIN
INTERIOR HIGHLAND
APPALACHIAN HIGHLAND
COAST RANGES
SIERRA NEVADA
ALASKA RANGE
Mt. McKinley 20,300 ft.
Mt. Logan 19,520 ft.
Mt. St. Elias 18,000 ft.
Mt. Rainier 14,408 ft.
Mt. Hood 11,225 ft.
Mt. Shasta 14,161 ft.
Mt. Whitney 14,501 ft.
Pikes Peak 14,110 ft.
Mt. Mitchell 6711 ft.
Mt. Washington 6293 ft.
Popocatepetl 17,888 ft.
Mt. Orizaba
Arctic Circle
Tropic of Cancer
Longitude West 100° from Greenwich
110°
120°
90°
80°
WILLIAMS ENGRAVING CO., N.Y.

Fig. 1

NORTH AMERICA
POLITICAL MAP
Scale of statute miles
0 100 200 400 600 800 1000
Capitals of Countries ⊙
Railroads
WILLIAMS ENGRAVING CO., N.Y. 1228
120° 110° Longitude West 100° from Greenwich 90° 80°
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
GREENLAND
(To Denmark)
ICELAND
BAFFIN BAY
Davis Strait
Denmark Strait
C. Farewell
ARCTIC ARCHIPELAGO
North Magnetic Pole
Great Arctic Circle
Bering Strait
Bering Sea
ASIA
C. Prince of Wales
Pt. Barrow
Nome
Yukon R.
Fairbanks
Mt. McKinley
ALASKA
Seward
Kodiak I.
Mt. St. Elias
Dawson
Mt. Logan
Mackenzie R.
Great Bear Lake
Great Slave Lake
Lake Athabaska
Juneau
Coast Ranges
Prince Rupert
QUEEN CHARLOTTE ISLANDS
VANCOUVER I.
Victoria
C. Flattery
Seattle
Tacoma
Columbia R.
Portland
Mt. Rainier
Mt. Hood
Spokane
Edmonton
Vancouver
Whitney
Lake Winnipeg
Nelson R.
Hudson Bay
James Bay
Hudson Strait
C. Chidley
LABRADOR (To Nfld.)
Belleisle Strait
Gulf of St. Lawrence
NEWFOUNDLAND
St. Johns
C. Race
Quebec
Halifax
C. Sable
Montreal
Ottawa
Toronto
Lake Ontario
Lake Erie
Lake Huron
Lake Michigan
Lake Superior
Duluth
Minneapolis
St. Paul
Boston
C. Cod
Buffalo
New York
Philadelphia
Baltimore
Washington
Chesapeake Bay
Norfolk
C. Hatteras
Milwaukee
Detroit
Chicago
Cleveland
Pittsburgh
Cincinnati
Louisville
Ohio R.
Missouri R.
Mississippi R.
Arkansas R.
Red R.
Rio Grande
Colorado R.
Sierra Nevada Mts.
Coast Ranges
Mt. Shasta
Mt. Whitney
Great Salt Lake
Salt Lake City
Denver
Pikes Peak
Kansas City
St. Louis
Memphis
Atlanta
Charleston
Savannah
Jacksonville
San Francisco
Los Angeles
San Diego
C. Mendocino
C. San Lucas
El Paso
Dallas
Houston
New Orleans
San Antonio
Galveston
UNITED STATES
Tropic of Cancer
Gulf of California
Sierra Madre
MEXICO
GULF OF MEXICO
C. Sable
Florida Strait
Key West
Havana
CUBA
BAHAMA ISLANDS (Br.)
WEST INDIES
I. OF HAITI
HAITI
DOMINICAN REPUBLIC
San Juan
Santo Domingo
PUERTO RICO (U.S.)
Yucatan Channel
GREATER ANTILLES
Port au Prince
JAMAICA (Br.)
Kingston
Gulf of Campeche
Mexico
Mt. Orizaba
Vera Cruz
Tampico
REVILLAGIGEDO ISLANDS
Acapulco
Salina Cruz
BRITISH HONDURAS
Belize
GUATEMALA
HONDURAS
Tegucigalpa
Guatemala
San Salvador
SALVADOR
NICARAGUA
Managua
COSTA RICA
San Jose
PANAMA
Panama Canal
Panama
Colon
CARIBBEAN SEA
CENTRAL AMERICA
SOUTH AMERICA
BERMUDA ISLANDS (Br.)

Fig. 2

Questions on Fig. 2. — 1. Is your home included in the area covered by this map? If so, show where it is. 2. Compare this map with Fig. 1 to find out whether railroads occur more often in highlands or lowlands. 3. Are there more large cities in lowlands than in highlands? 4. How many cities shown on this map are not on any waterway?

North America seems to be included? Locate such areas as accurately as you can. The rock that has probably never been under the sea we call old rock. What sections contain chiefly old rock?

In the western part of North America, from Central America to Bering Sea, there is a great variety of rocks. Some are old rock, like granite; some are sedimentary; but most of them are *lavas*, having come in a molten state from volcanoes, and for that reason they are often called *igneous* or fire rocks.

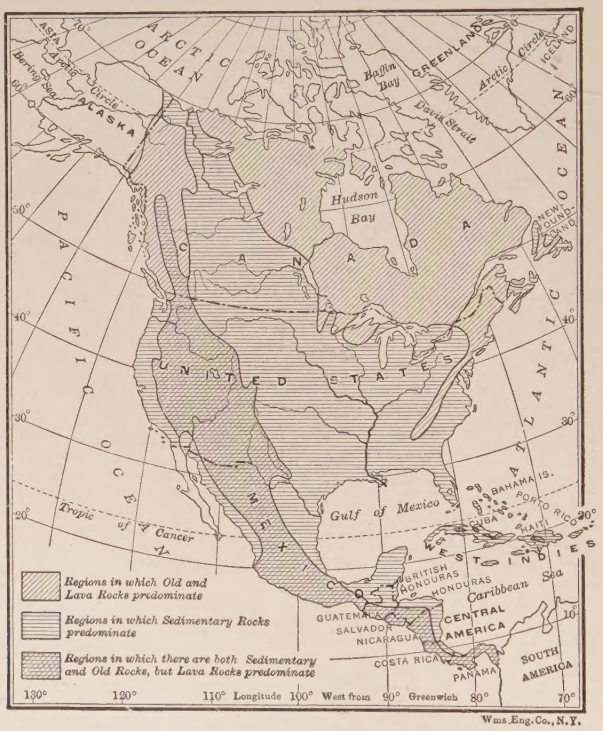


Fig. 3. — The rocks of North America

What minerals are usually associated with old and lava rocks? In what class is coal found? Limestone, used in making lime and cement and in building construction, is a sedimentary rock. Since the rock regions of Alaska are somewhat complex, no attempt is made to show them here.

Importance of this distribution

It is important to remember the distribution of the several kinds of rock, because certain valuable materials are found with certain kinds. Coal, oil, and gas, for example, are found in sedimentary rocks. Gold and silver, copper, and nickel are found in old rock or igneous rock. Lead sometimes accompanies silver. In our country, however, the more important lead and zinc deposits are in regions of sedimentary rock. Much of our iron ore was probably first associated with igneous rock, but has been washed out of that and collected into beds or seams in sedimentary rock. Thus the kind of rock suggests the kind of metal, if any, that we may expect to find in it.

The Coal Period. — One of the most interesting periods in the history of the continent was that during which the plant remains were deposited from which our coal has been formed. There is good proof that coal is made of plant remains. Roots of plants may still be seen in the old soil, now changed to rock, that lies beneath the coal beds; and stems of plants and even trunks of trees, changed to coal, are found in the coal beds. Besides, with a microscope, or at times even with the naked eye, one can see that coal is made of bits of plants pressed closely together. Sometimes the full form, or *fossil*, of a fern or leaf may be seen.

What coal is made of

As the crust of the earth slowly shrank and wrinkled, the land was raised and lowered. Even now it is slowly moving in some places, just as it was during the Coal Period. At that time parts of the old sea bottom were raised above

How coal beds were formed, and their distribution

the water, forming extensive plains in the eastern part of North America. Those plains were so low and level that vast swamps were formed, in which vegetation grew. It was probably much warmer here at that time than now, and the rains were far heavier. In consequence, the vegetation was very rank, as in a tropical jungle. Possibly it was even much ranker than that found to-day in the sea, and layers of mud, sand, and gravel collected over them. These have since been hardened into layers of rock, making sedimentary rock, previously mentioned; and the vegetation beneath them has been changed, by the pressure of the layers of rock above them, into coal. After another long period the sea bottom was raised once more, and dense swamp vegetation

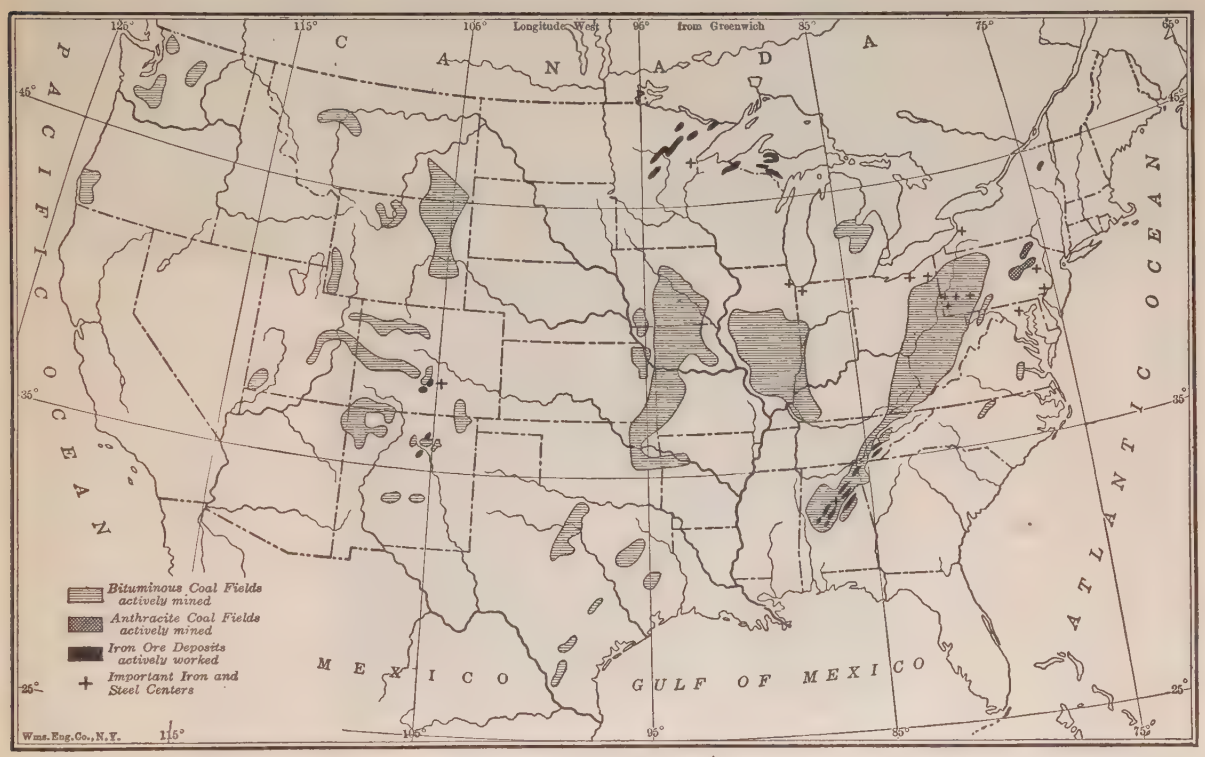


Fig. 4. — Coal fields, iron ore deposits, and steel centers in the United States

Everglades of Florida or the forests of the Amazon.

The plants of the Coal Period were very different from those of the present; indeed, although some of the ferns resembled those of to-day, none of the many kinds of trees that we now know grew in those ancient forests.

After the plants had grown in the swamps for hundreds of years, sometimes to a depth of many feet, the plains sank beneath the grew again. After many more centuries the plains again sank, and the swamp vegetation was covered over as before. This rising and sinking of the land continued for ages, one set of layers of mud, sand, gravel, and vegetation being covered up by another, until many such sets were formed, producing many seams of coal separated by layers of rock. These are usually only two or three feet thick, but some are as much as ten or fifteen feet in thickness. Can you

explain why pieces of black rock, called *shale*, are often found in coal?

The distribution of these coal beds in the United States is shown in Fig. 4. What facts do you observe there? Judged from their extent, the swamps may possibly have covered as much as one tenth of the area of the continent.

When the plants died they fell into the water, making a woody matting which did not fully decay because the water prevented air from reaching it. If it could then have been dug up and dried, it would have made good fuel. Indeed, in Ireland, Norway, and other cool, moist lands, it is now possible to dig such woody matter out of the swamps and dry it for burning (Fig. 5). Such fuel, called *peat*, is much used for cooking and heating. Some of the poorer coals, known as *lignite*, are little more than peat beds partly changed to mineral coal.

The different kinds of coal

© *Underwood and Underwood*

Fig. 5. — Digging peat in Ireland

Other beds, having far more pressure upon them, have been changed to harder coal. One kind of coal, called *anthracite*, found in eastern Pennsylvania, has been so greatly changed that it is as hard as some rocks, and is known as *hard coal*. But most of the coal, like that of western Pennsylvania and the North Central States, although a real mineral and harder than lignite, is not so hard as anthracite. This is called *soft*, or *bituminous*, coal. The difference in hardness between anthracite and bituminous coal in Pennsylvania is due not to difference in age, but to a difference in pressure between various areas when the highlands were being formed.

The history of our mountain systems. — During the thousands of years that the continent was slowly growing, mountain systems were forming in both the East and the West. These were caused by the shrinking and wrinkling of the earth's crust. They have had a great influence upon our climate, and therefore upon our crops, our animals, and ourselves.

Some facts in the history of the Appalachian Highland and the Western Cordillera

Most of the land in the Appalachian Highland (Fig. 1) was uplifted just after the Coal Period. Since then it has been slowly worn away by weathering and by running water, and thus lowered so that the mountains are now neither very high nor very rugged. Still, there are some peaks which rise more than a mile above sea level.

The western mountains, or *Western Cordillera*, are younger and therefore less worn down than those of the Appalachian Highland. For this reason they are much more rugged, with many deep canyons and lofty peaks, a few of which rise three miles and

© Keystone View Co., Inc.

Fig. 6. — Mt. Shasta, a volcanic peak of California

Locate Mt. Shasta on the map (Fig. 1). What is its elevation above the sea? It rises from a base whose altitude is about 4,000 feet. What, therefore, is the actual height of the mountain? There are several small glaciers on its upper slopes. The lower mountain in the foreground is called Black Butte.

more above sea level. This, of course, includes the elevation of the broad plateau on which they rest, which itself is in many places more than a mile in height, or as high as the mountain peaks of the East. Some of these mountains are still growing, and now and then an earthquake is caused as the mountain rocks slip and move under the great strain.

How volcanic mountains were formed

While the mountains of the Appalachian Highland and the Western Cordillera have been caused by the wrinkling of the earth's crust, many of the mountain peaks in the West have been formed in a different way. They are conical in form and are built up of material that was forced to the surface from within the earth when they were active volcanoes. Mt. Lassen, in California, is now active; so are many in Alaska, Mexico, and Central America.

Great quantities of lava formerly flowed out of fissures or crevices in the rock and spread over the surface of the plateau about the bases of many of these mountains. Hundreds of thousands of square miles of the western part of the United States were thus covered with lava.

How the Mississippi Basin was formed. — From the mountain systems of the East and

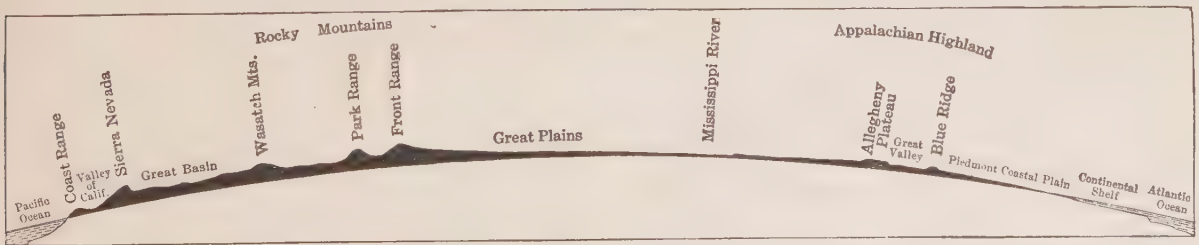


Fig. 7. — Diagram of a cross section of the United States at about the thirty-seventh parallel

West, the land slopes gently toward the Mississippi River (Fig. 7). These slopes form a trough, through the lowest part of which this river flows. It was mainly by the uplift of the mountains on its two sides that this broad trough was formed. Measure its width on the map of the United States (Fig. 17).

Like the mountains, this extensive region, called the *Great Central Plain* (Fig. 1), has had a long history. At one time so much of it was under water that a sea extended from what is now the Gulf of Mexico all the way to the Arctic Ocean. In the rock layers that lie beneath the soil of the lowland are found many fossils of shells, coral, and fish that lived in this ancient sea. When these animals died, their harder remains were buried in the beds of sand, clay, and gravel that have since become rock.

After long ages most of this ancient sea bottom was raised to form dry land, although a part of it — from the Gulf of Mexico to the southern part of Illinois — remained under water for a long time afterward. Into this sea the Mississippi and other rivers discharged their floods and dropped their load of sediment, swept from the plains and distant mountains. As time went on, the river sediment partly filled up this sea and formed *deltas* and *flood plains* which, raised by a slight uplift, are among the most fertile lands of our country. And now the Mississippi River seems bent on filling up the Gulf of Mexico itself. Already it has built its delta far out into the Gulf, as you can see (Fig. 1).

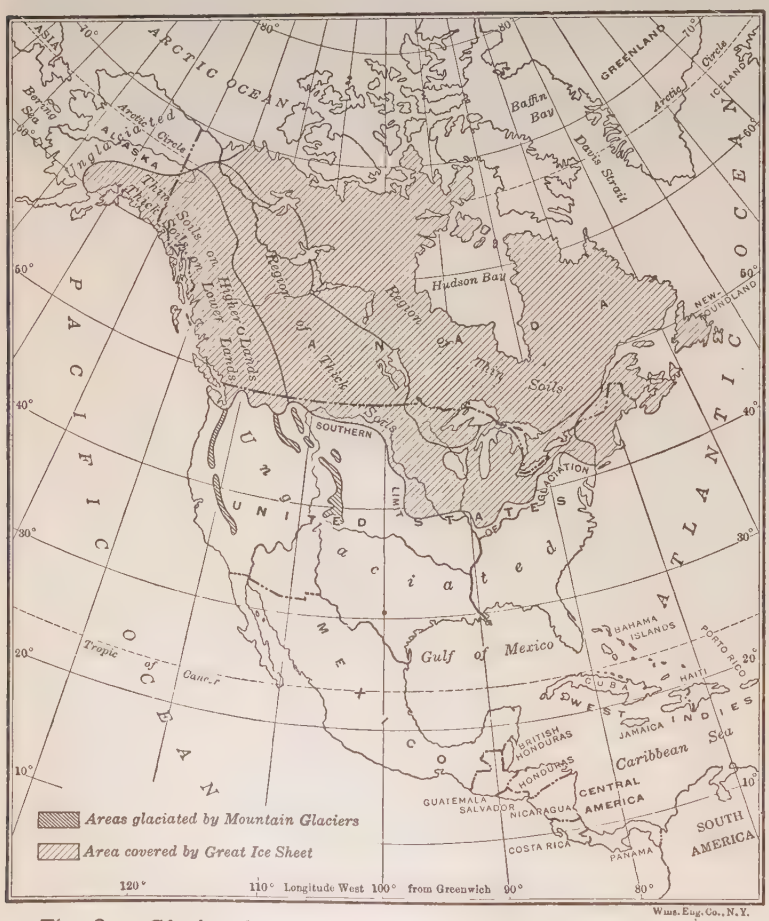


Fig. 8. — Glaciated and unglaciated portions of North America

Trace the southern border of the area covered by the Great Ice Sheet, known as the *glaciated* area. How much of North America was glaciated? What portion of the continent has thin soils? What portion has deep or thick soils within the glaciated area? In areas of thin soils, the Ice Sheet scraped away, or *eroded*, more than it deposited. In areas of thick soils, it deposited more than it eroded.

The Great Ice Sheet. — Long after the coal beds and the mountains were formed, there came another series of very important events on this continent. It became, at various periods separated from one another by long intervals of time, far colder than it now is, just as during the Coal Period it was much warmer. Indeed, it became

How vast sheets of ice, or glaciers, were formed

so cold that sheets of ice, or *glaciers*, were formed, so great that they covered most of the northern part of North America.

An ice sheet similar to those ancient ones may still be seen in Greenland (Fig. 1). Except along the very coast, the immense island of Greenland is now buried beneath a glacier which is as large as fifteen states the size of New York State.

The Greenland glacier is made of snow that has fallen in immense quantities on the high interior. You know that you can change a snowball into ice by pressing it in your hands. In a similar way, the pressure of the great mass of snow in Greenland has changed the lower layers into ice. As the snow collects and becomes ice, it spreads out, or *flows*, from the interior toward the coast. The great glaciers that grew up in North America no doubt were produced by snow and spread out in the same way.

The last of these, which we shall refer to as the *Great Ice Sheet*, covered most of the northeastern part of North America, reaching about as far south as New York City and the Ohio and Missouri rivers; but, as you can see from the map (Fig. 8), it did not reach very far south in the Northwest.

Extent of the Great Ice Sheet, and changes that it made

The Greenland glacier, moving toward the sea, drags away the soil, tears off fragments of the rock, and scours the rock layers as if it were a mighty sandpaper. The movement is very slow, yet the ice is always pushing onward to the sea, where enormous *icebergs* are constantly breaking off and floating away (p. 188). The Great Ice Sheet did the same things.

Being very thick and therefore very heavy, it swept away the soil that covered the land. Not only did it do this, but, with the help of rock fragments held fast in its bottom, it

Fig. 9. — Rock surface stripped of soil and smoothed by glacial ice

scraped off pieces of the solid rock and carried them forward with it. As it slowly moved over the surface, it also ground bowlders and pebbles together and rubbed them against the solid rock, scratching and grooving it (Fig. 9). Scratches thus made may still be seen pointing north and south.

The rock and soil that the glacier carried along were finally left in various places by the melting of the ice. Great heaps of clay and gravel, called *moraines*, were deposited along the outer margin wherever that remained stationary for a considerable period. Some of the moraine hills, or hummocks, are between one and two hundred feet high.

After standing for a while, and building a moraine in one place, the front of the glacier melted away toward the north; and each time that it halted it built up new moraines along its front. During the thousands of years that the Great Ice Sheet lasted, it carried millions of tons of clay and rock from one place to another, and built many low moraine hills, very irregular in shape.

The work of rasping, digging, carrying, and dumping which was done by the Ice Sheet has caused it to be likened to a combined file, plow, and dump cart of enormous size.

It was this Ice Sheet which caused the great number of lakes and ponds in the northeastern part of North America. Minnesota alone is said to have ten thousand, and in New England also there are many thousands (Figs. 32 and 77). Most of the states outside the region covered by the Ice Sheet have very few lakes.

Effects of the work of the Ice Sheet

1. Upon our lakes

The manner in which these lakes were formed is as follows. The load of clay and bowlders, or *drift*, was not dumped evenly over the land. Hollows and ridges were left, and after the ice melted, water filled the hollows, forming ponds and lakes. In other cases the drift partly filled valleys and thus built dams, behind which ponds and lakes collected.

Even our Great Lakes probably did not exist before the coming of the Ice Sheet. Their basins occupy broad river valleys which have been blocked by dams of drift and deepened by the plowing of the ice.

The Ice Sheet has also had an important influence upon our manufacturing. The deposit of drift in valleys often so filled them that, after the ice was gone, the streams were forced to seek new courses. These courses sometimes lay down steep slopes, or across buried ledges, over which the water now tumbles in many rapids and falls. Even the great cataract of Niagara (Fig. 27) was caused in this way, and the same is true of the falls and rapids of hilly New England (p. 34) and New York. The many lakes are reservoirs that help to maintain a constant flow of water. In this way certain regions, as we shall see, came to have the abundant water power which has helped to make them important manufacturing regions. In most sections of our country not reached by the ice, rapids and falls are much less common. Did the Ice Sheet cover the land on which you live? (See Fig. 8.)

2. Upon our manufacturing

A third important influence of the Ice Sheet was upon the soil, and therefore upon our farming. In many parts of the country the soil has been made by the decay or *weathering* of the rock; but in the areas which the ice covered, the weathered rock was swept away, and drift was left in its place. Here the soil was made by the grinding of rocks together, much as flour is made by grinding wheat; in fact, some glacial clay is called *rock flour*. In some places the layer of drift that the ice left is several hundred feet deep.

3. Upon our agriculture

On the other hand, in some places the ice failed to grind the rock into tiny bits, but left many pebbles, and even large bowlders, to cover the ground and hinder the farmer. In other places the great quantities of water supplied by the melting ice washed away much of the rock flour. This left extensive sand and gravel plains that are by no means fertile.

Formation of the coast line. — In studying the Mississippi Basin and the formation of coal, we saw that the sea bottom, and even the dry land, are not always the same. On the contrary, they may slowly rise or sink. Such changes in the level of the land are even now in progress in many places, though the process is so slow that many years, and even centuries, must pass before the changes become evident. For instance, much of the land along the eastern coast of the United States is probably sinking, while portions of our western coast are rising.

Recent movements of the land

Some of the recent changes in the level of the land have had an important effect. This is shown on our northeastern coast, where the

Effects of sinking of our northern coast

land has sunk several hundred feet. By this sinking, the ocean water has been allowed to enter the valleys, leaving the higher land to form peninsulas, capes, and islands, while the valleys have become harbors, bays, and straits (Fig. 1).

Many good harbors were made by this sinking of the land, the best being where rivers enter the sea. When the land was higher, the streams carved out broad valleys; but as the land sank, the sea entered, forming extensive bays. That is the way in which the Gulf of St. Lawrence was formed; also New York, Delaware, Chesapeake, and San Francisco bays, as well as many other excellent harbors on the east and west coasts. What rivers carved out the bays mentioned? (See Figs. 32 and 175.)

Bordering our eastern coast is a broad ocean-bottom plain, called the *continental shelf*, where the water is comparatively shallow (Fig. 1). If the continental shelf were raised a few hundred feet, it would form a plain.

The rising of our southern coast

That part of the Southern States which borders the Gulf of Mexico and the Atlantic Ocean was once a part of this continental shelf, but has been elevated above sea level and now forms a low plain (Fig. 1). After this plain was raised, however, and after rivers had cut shallow valleys, the coast was slightly lowered; thus bays and sounds were formed. The Florida peninsula is also a sea bottom that has been slightly lifted above the ocean.

Present size, shape, and position of our continent. — After the many changes that have gone on during many long ages, owing to the rising and sinking of the land, North America is now third in size among the seven continents of the earth. Which are larger? Which are smaller? (Look up in Appendix.) The continent has the form of a triangle, with the broadest portion in the north. Compare its shape with that of South America (Fig. 251); of Africa (Fig. 472).

The northern part is so wide that Alaska extends to within fifty miles of Asia. Labrador, however, the part of the continent that extends farthest east, is over 2,000 miles from Europe.

Importance of this position. — Most of the inhabitants of North America live far to the south of Alaska and Labrador, where the oceans are much broader. Thus the densely populated portion of the continent is a long distance from Europe on the east, and a still greater distance from Asia on the west. This wide separation from other continents has had a great influence upon the history of the people of North America. It helps to explain, for instance, why the Spanish colonies were able to win their independence from Spain, and the United States its independence from England; for the distance across the sea was too great for the mother countries to send large armies and the supplies necessary for their support.

Our distance from other continents helps also to explain the growth of our industries. At first the colonies imported even bricks, doors, and furniture from Europe. But it proved so troublesome and expensive to carry such goods so far that our settlers soon learned to produce most of the articles they needed for themselves. Thus we early began to manufacture.

Now that men have learned the use of steam, the distance from other countries is not so serious a drawback. Sailing vessels are very slow and always at the mercy of winds and storms. Steamships, on the other hand, are easily controlled, and may go as

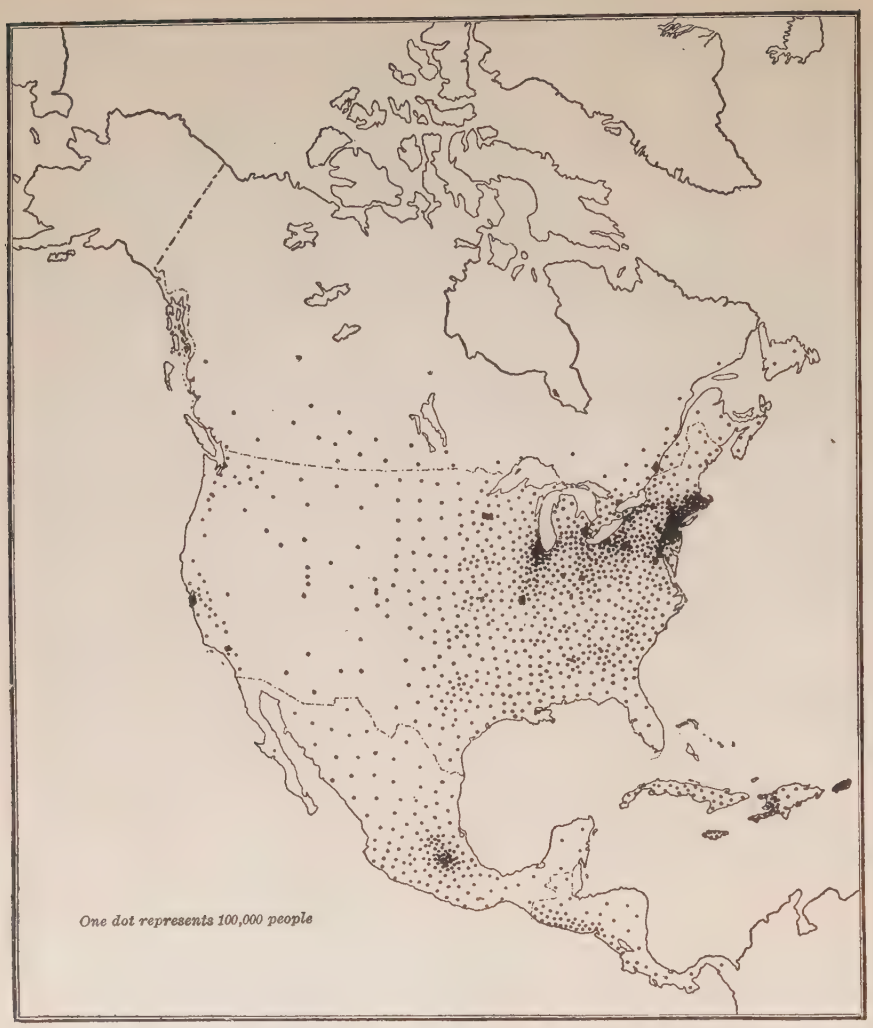


Fig. 10. — Distribution of population in North America

Each dot represents 100,000 people. It must not be thought that the entire hundred thousand are congregated at the place indicated by each dot, except in the case of cities. On the other hand, they are distributed more or less evenly over the area between the dots. Cities of 200,000 or more are represented by a group of dots in which the dots are very close together.

far in one day as the old-fashioned sailing vessels traveled in a week. With the use of steam, therefore, immigrants from Europe have found their way here by millions; and trade with Europe and other parts of the world has rapidly developed. Steam has made the ocean an excellent highway for reaching distant points. Thus our separation from other continents has helped in many ways to make us independent, without bringing serious disadvantages.

Facts to be especially well fixed. — 1. The way in which coal was formed. 2. The three kinds of coal, and the location of the principal beds. 3. The location of the Appalachian Highland and the Cordilleran Highland. 4. The effects of the Great Ice Sheet. 5. The effects of the sinking and rising of our coast line.

Problems for independent study. — 1. What signs would you look for, to tell whether or not the Ice Sheet had covered a certain section? Tarr, Ralph S., and von Engeln, O. D.: *New Physical Geography*, revised edition, pp. 246–297 (Macmillan). Are there any such signs in your neighborhood? 2. Make a collection of different kinds of coal, including peat. See what proof you can find of the statement that coal has been made from plants. Allen, N. B.: *Geographical and Industrial Studies: United States*, Chapter XI (Ginn); Fisher, E. F.: *Resources and Industries of U. S.*, pp. 143–144; National Geographic Magazine, Nov., 1918, pp. 423–429. 3. Hunt for fossils in your neighborhood. 4. Make a collection of specimens of different rocks to illustrate the kinds mentioned in the text. 5. Make a drawing showing the extent of the Great Ice Sheet, particularly the states that were covered wholly or partly by it. 6. The icebergs from the Greenland glacier are a source of great danger. What is the danger, and what precautions are

taken to escape it? Encyclopedia Americana, vol. 14, pp. 626–627; Gibson, J. C.: *Wealth of the World's Waste Places*, Chapter XIV; World Book, vol. 4, pp. 2903–2904.

How to make use of the headings in this book. — Each section of the text in this book is the answer to some question. You should keep this question in mind as you read. In that way you can easily discover the principal facts.

What the question is for each section is suggested by the sectional heading in black type. For example, on p. 7 is the heading **How the Mississippi Basin was formed.** The question thus suggested is "How was the Mississippi Basin formed?" The answer occupies three paragraphs. Then comes the topic (p. 8) **The Great Ice Sheet**, under which the first question suggested is, "How were vast sheets of ice formed?" and the second, "What was the extent of the Great Ice Sheet and what changes did it make?" As you begin a section you should note the question indicated in the heading; you should make sure that you have a fairly complete answer to it before proceeding to the next section.

II. Life upon the Continent

Political Unit or Group	Area in Square Miles	Population
United States	3,027,000	105,711,000
Alaska	590,900	55,000
Canada and Newfoundland	3,892,400	9,051,000
Greenland	827,300	14,000
Mexico	767,200	14,235,000
West Indies	91,000	10,200,000
Central America	215,700	5,917,000
North America	9,411,500	145,183,000

Questions. — Which one of the above countries or groups of countries is shown to be the most densely populated? Which is the most sparsely populated?

Distribution of inhabitants of North America. — As shown by the above table, there are now about 145,000,000 inhabitants in North America. Note how many of these live in the United States; Canada; Mexico; Central America. Fig. 10 shows how unevenly they are distributed. Since each dot represents 100,000 people, by counting the dots in any particular area you can learn how many people it contains. In some areas, however, the dots are crowded too closely together to be counted, while in other broad areas there are too few inhabitants to allow any dots at all. Point out some of the most densely populated areas, and some that have few or no inhabitants.

Why there are few inhabitants in the far North. — Why are the people so unevenly distributed? Fig. 12 suggests why there are few in the far North. North of a certain line that you see on the map, the average temperature even during the warmest summer month does not go above 50° Fahrenheit. That area is the region *of cool summers and extreme winters*. The summer days are long, but the heat waves strike the earth at such a slant as to lose part of their strength. The surface thaws out to a depth of a few inches, but there is ice in the swamps at all seasons. The winters, of course, are very cold, the thermometer often going down to 50° and more below zero.

In such a region agriculture is almost out of the question. In fact, it is too cold even for trees, except possibly on some south-

UNITED STATES
POLITICAL MAP
Scale of statute miles
0 50 100 200 300 400
National capitals
State capitals
Railroads
Canals
Cities with over 1,000,000
New York
Cities with 200,000 to 1,000,000
St. Louis
Other cities
Richmond
WILLIAMS ENGRAVING CO., N.Y.
1223
PACIFIC OCEAN
GULF OF CALIFORNIA
LOWER CALIFORNIA
MEXICO
WASHINGTON
OREGON
IDAHO
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
NEVADA
UTAH
COLORADO
KANSAS
ARIZONA
NEW MEXICO
OKLAHOMA
TEXAS
Seattle
Tacoma
Olympia
Everett
Spokane
Portland
Astoria
Salem
Boise
Butte
Helena
Billings
Bismarck
Pierre
Regina
Winnipeg
Lake Manitoba
Devils Lake
Fargo
Minot
Missoula
Glacier National Park
Flathead Lake
Yellowstone National Park
Black Hills
Cheyenne
Denver
Colorado Springs
Pueblo
Wichita
Oklahoma City
Fort Worth
Austin
San Antonio
El Paso
Albuquerque
Santa Fe
Phoenix
Tucson
Los Angeles
San Diego
San Francisco
Oakland
Berkeley
Sacramento
Stockton
Fresno
Reno
Carson City
Salt Lake City
Ogden
Pocatello
Great Salt Lake
Yosemite National Park
Sequoia National Park
Mt. Whitney
Death Valley
Tulare Lake
Mt. Shasta
Mt. Hood
Mt. Rainier
Mt. Adams
Mt. Jefferson
Mt. Scott
Mt. Pitt
Mt. Blaker
Crater Lake National Park
Lassen Peak
Santa Barbara
Santa Barbara Islands
San Bernardino Mts.
San Francisco Mts.
Pt. Conception
C. Flattery
C. Blanco
C. Mendocino
Victoria
Vancouver I.
Columbia R.
Snake R.
Clark Fork
Kootenai R.
Salmon R.
Bitterroot Range
Yellowstone R.
Big Horn R.
Powder R.
Little Missouri R.
Missouri R.
Milk R.
Cheyenne R.
White R.
Niobrara R.
Platte R.
South Platte R.
Republican R.
Smoky Hill R.
Arkansas R.
Canadian R.
Red R.
Pecos R.
Rio Grande
Nueces R.
Brownsville
Montefey
Chihuahua
Gila R.
Colorado R.
Green R.
Sevier R.
Humboldt R.
Sacramento R.
Sevier L.
Utah L.
Pikes Peak
Longs Peak
Gulf of California
Longitude
West

Fig. 11

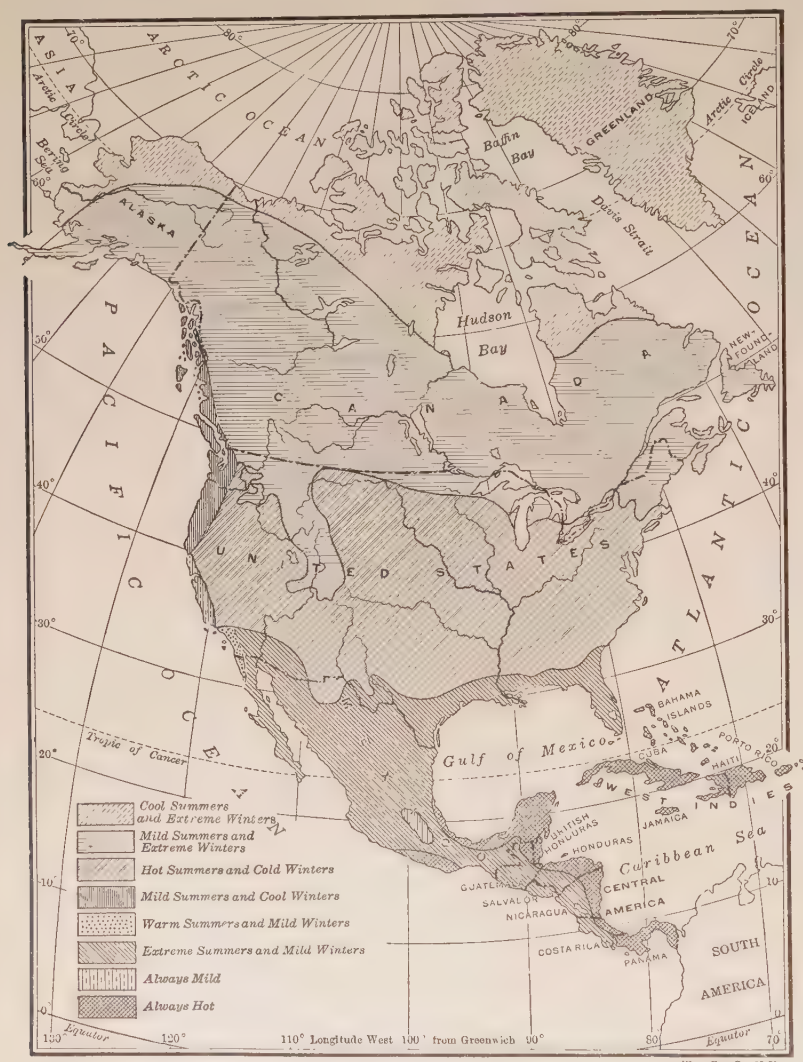
Lake Winnipeg
Lake Nipigon
Lake of the Woods
Rainy Lake
Red Lake
L. Itasca
Duluth
Minneapolis
St. Paul
Sioux Falls
Sioux City
Des Moines
Rockford
Chicago
Milwaukee
Madison
Grand Rapids
Lansing
Detroit
Flint
Port Huron
Lake St. Clair
Toledo
Cleveland
Erie
Buffalo
Niagara Falls
Toronto
Rochester
Utica
Syracuse
Schenectady
Albany
Lake Ontario
Lake Erie
Lake Huron
Lake Michigan
Isle Royale
Lake Superior
Sault Ste. Marie
Georgian Bay
Ottawa R.
Ottawa
Montreal
Quebec
St. Lawrence R.
Lake Champlain
Burlington
Montpelier
Mt. Washington
Portland
Auburn
Bangor
Concord
Manchester
Lowell
Lynn
Massachusetts Bay
Cambridge
Boston
Worcester
Cape Cod
Springfield
Providence
New Bedford
Fall River
Hartford
New Haven
Bridgeport
Long Island
New York
Jersey City
Newark
Elizabeth
Paterson
Trenton
Camden
New Jersey
Wilmington
Dover
Philadelphia
Harrisburg
Reading
Scranton
Pittsburgh
Youngstown
Akron
Canton
Fort Wayne
South Bend
Whiting
Baltimore
Washington
Potomac R.
Chesapeake Bay
C. May
Delaware Bay
Columbus
Dayton
Cincinnati
Ohio R.
Indianapolis
Springfield
Peoria
Illinois R.
Kansas City
St. Joseph
Jefferson City
St. Louis
East St. Louis
Missouri R.
Evansville
Frankfort
Louisville
Kentucky R.
Charleston
West Virginia
Richmond
James R.
C. Charles
C. Henry
Norfolk
Albemarle Sound
Roanoke R.
Cairo
Ohio R.
Winston-Salem
Raleigh
Pamlico Sound
C. Hatteras
Knoxville
Nashville
Cumberland R.
Tennessee R.
Mt. Mitchell
Cape Fear R.
C. Lookout
Wilmington
Memphis
Arkansas R.
Chattanooga
South Carolina
Columbia
C. Fear
Little Rock
Atlanta
Charleston
Birmingham
Macon
Savannah R.
Savannah
Red R.
Ouachita R.
Mississippi
Alabama
Georgia
Shreveport
Jackson
Montgomery
Tombigbee R.
Alabama R.
Chattahoochee R.
Pearl R.
Jacksonville
Louisiana
Mobile
Baton Rouge
Apalachicola
Tallahassee
Apalachee Bay
New Orleans
Houston
Galveston
Mississippi Delta
C. Canaveral
Tampa
Tampa Bay
Lake Okeechobee
Palm Beach
Florida Straits
Miami
Bahama Islands
(British)
C. Sable
Key West
Gulf of Mexico
Atlantic Ocean
98°
89°
85°
81°
77°
73°
69°
45°
41°
37°
33°
29°
25°
93°
Greenwich
89°
85°
81°
77°
1926

Fig. 11

facing slopes. Even these are more like vines than trees, sometimes rising only a few inches above the ground.

Since there is so little vegetation, few large land animals can thrive. The caribou, moose, fox, and polar bear are the principal four-footed beasts; but birds are more numerous. Many more animals have their homes in the sea than upon the land, because there, except at the very surface, the temperature never goes below the freezing point. Therefore there are plenty of sea animals of all sizes, from those so small that they cannot be seen without a microscope, to the whale, the largest of all animals.

On account of the unfavorable conditions for agriculture, man can do little in all this region except hunt and fish. Human habitations are here chiefly along the coast. Where hunting and fishing are the principal occupations, there can be few inhabitants. It is probable, therefore, that the belt of *cool summers and extreme winters* will never be thickly populated.



Modified from Köppen and Jefferson

Fig. 12. — Temperature regions of North America

Why the population is so small in western North America. — **Influence of temperature on the population**

South of this region are several belts that are warmer, the farther south they lie. The first is that described on the map as the region of *mild summers and extreme winters*. Trace its boundaries. Next comes the belt of *hot summers and cold winters*, after which is the belt of *extreme summers and mild winters;* and, still farther south, an area marked *always hot*. Note what portion of the continent is included in each of these.

Bordering the Pacific are regions in which the temperatures are moderated by the winds that blow in from the ocean. The northern part of this coast and a narrow belt inland from it is a region of *mild summers and cool winters*. What tem-

perature region is east of this? Farther south is a region that is *always mild*, and still farther south is a region of *warm summers and mild winters*. What temperature belts are directly east of these, beyond the limits of the ocean's influence?

Only the northern half of the first of these belts, which includes a large part of Canada, is too cold for agriculture. What does Fig. 10 tell you about its population? Yet a low temperature is not the only reason for a thin population, for the same figure shows a very scant population in most of western North America from Canada southward across the United States far into Mexico. What are the reasons for this?

Fig. 13 suggests the answer. It shows that over most of this region the rainfall is slight. How many inches do you find? For an explanation of this light rainfall see p. 131. Where the fall is less than twenty inches the ordinary kind of agriculture cannot be carried on. Point out the areas that have less than that amount. Some sections have less than ten inches, and are deserts or semi-deserts. Locate them.

Influence of rainfall on the population
1. The general rule

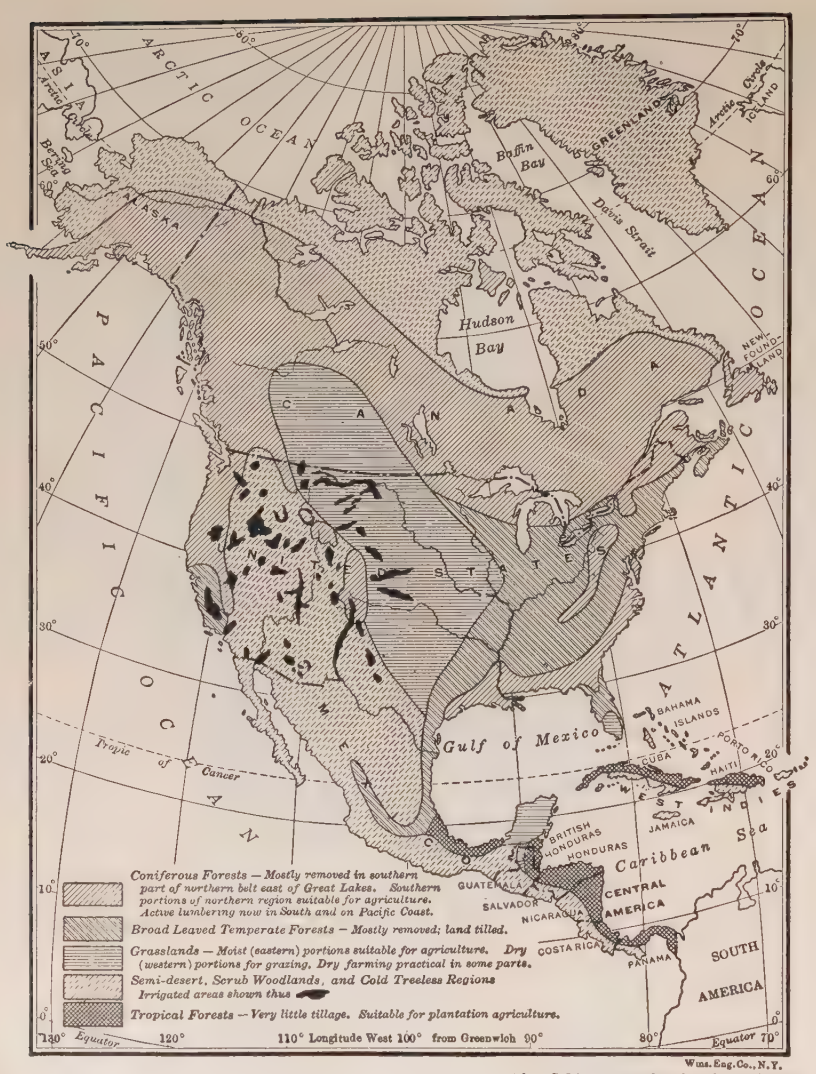
Wms. Eng. Co., N. Y.

After Gannett and Office of Farm Management, U. S. Dept. of Agric.

Fig. 13. — Annual rainfall in North America

Regions that have a rainfall of twenty inches or more may be considered as humid; from ten to twenty inches, semi-arid; less than ten inches, arid. What meridian marks approximately the western border of the humid portion of North America? About how much of the United States is humid? How much arid and semi-arid? Answer the same questions for Canada.

Where there is so little rain, vegetation is almost as scant as in the belt of *cool summers and extreme winters*. The sagebrush is the most common plant, being common throughout the arid area. Others are the century plant and the cactus. Some of them have no leaves, so that they expose little surface to the air, and thereby suffer little from evaporation. Some have such large roots that the part underground is greater than that above.



After Schimper, modified and simplified

Fig. 14. — The plant regions of North America

1. In what portion of the continent is the cold treeless region? In what temperature region is this portion of the continent? 2. What country has the largest area of evergreen, or *coniferous*, forests? 3. Why are there coniferous forests in the Appalachian and the Cordilleran highlands similar to those of Canada? 4. In what part of the United States are there broad leaved trees? What is the rainfall in this area? 5. Where are the grasslands of the continent? What is the rainfall in the eastern part of this region? In the western? 6. What is the rainfall in the semi-desert and scrub vegetation region? Small areas of this large region are true desert. Is this region as useless for agriculture as the cold treeless region? Only a few of the irrigated areas are shown here. For a more complete irrigation map see Fig. 156.

7. Show the relation of rainfall to types of plants along the fortieth parallel in the United States from east to west. 8. Why should the east and northeast portions of Cuba, Haiti, and Central America have tropical forests while the south slopes have scrub? See Fig. 13. 9. Why is Yucatan a grassland? See Fig. 13.

The locations of the boundaries of this map are to be considered only as approximate. No sharp line can be drawn between types of vegetation.

Possibly you know other ways in which such plants adapt themselves to a dry climate.

Most of these plants are of very little use to man; but there is a grass in many districts that is especially valuable for grazing.

The many mountains in this region also make much of the surface too rough for agriculture, even if there were sufficient rainfall. Name the principal mountain systems, and show their extent (Fig. 1). In one way, however, these mountains are helpful. They receive more rain than the lower lands about them, and thus permit more abundant vegetation and animal life.

2. Some exceptions to it

For a long time the arid region was like the cold region in being of little use to man. It was valuable mainly for hunting and grazing, and could therefore support few inhabitants. If you compare Fig. 10 with Fig. 13, you will see that the more densely populated areas are in general those that have the heavier rains. Yet, if you examine the map closely, you will discover that this rule does not always apply. There are many important exceptions in this portion of the continent. For example,

a small section of southern California is densely populated. Although the climate of this region is very dry, its population has in recent years been rapidly increasing. You will learn the explanation of this later in your study of the Western States (p. 140).

Some of the reasons for the great population in the eastern portion of the continent. — The more densely populated areas shown on Fig. 10 are usually regions that have three important advantages: their temperature, particularly during the summer, is high enough, their rainfall is heavy enough, and the surface of the land is level enough, for profitable agriculture. Agriculture is the greatest occupation in the world; more persons are engaged in it than in any other; and all the others are greatly dependent upon it.

The larger areas of adequate rainfall, moderate temperatures, and level land

Note the temperatures of the more densely populated portions of the continent. In which of the belts just mentioned do these densely settled areas lie? What do you discover about their rainfall and surface features? Do they have the three advantages just named?

No doubt you quickly find some exceptions. For example, a part of Mexico that is thickly populated has only a light rainfall. Also, the state of Pennsylvania, whose population is nearly equal to that of all our Western States together, is somewhat mountainous. What has brought so many people to these localities in spite of such disadvantages you will learn in your later study of geography.

On the other hand, some of the regions that meet these three conditions admirably have very thin populations. They may be too hot and unhealthful, or too swampy, or not fertile enough, for agriculture. Can you find any such regions?

It is evident that climate and surface features have exerted a great influence upon the density of population of the different parts of our continent. They have prevented large sections from becoming populated; have kept the population scant in other sections; and in still others have greatly favored settlement.

The great variety of factors determining density of population

It is true also that there are many other factors that influence density of population besides these two. For example, much depends upon the advantages of a given area for trade with other areas; upon its mineral deposits; and upon the ease with which materials can be transported from one place to another.

How a great many factors have worked together — some helping and others hindering — to determine the population in each part of the continent, makes up a large part of the study of geography.

Facts to be especially well fixed. — 1. The most densely and the most sparsely populated sections of North America, with the explanation of each. 2. The effect of the Western Cordillera upon the rainfall of the western half of the United States.

Problems for independent study. — 1. How are some of the animals in the far North protected from being discovered by their enemies or by their prey, through their coloring? Encyclopædia Britannica, vol. VI, p. 731 (see Colours of Animals); Tarr, R. S., and von Engeln, O. D.: *New Physical Geography*, pp. 555–556 (Macmillan). 2. One industry besides hunting and fishing may flourish extensively in the far North. What is it? Higginson, E.: *Alaska*, pp. 253–255 (Macmillan). What reasons can you give for expecting its development in the not very distant future? 3. Name the principal kinds of coniferous and broad-leaved trees of North America (see Fig. 14). Also, collect pictures, or

make drawings or paintings, of them. Rogers, J. E.: *Trees That Every Child Should Know* (Doubleday Page). 4. What, do you imagine, would be the effect upon the density of population about New York City if the temperature there became as cold as in northern Canada? If it became as hot as in southern Mexico? 5. Would North America have a larger or a smaller population if the broader part of the triangle were in the south instead of in the north?

A class or school library that would be especially valuable for geography — It would make your work in geography much more interesting if you would start a class or school library for that subject. There are some magazines and other publications which you ought to have at hand for use when you have spare time, or for which you might sign up, as you would in a public library, and take home with you to read. You ought first to take a good daily newspaper. Among the good magazines for which you might subscribe are the following:

National Geographic Magazine, Washington, D. C.

The World's Work, Garden City, N. Y.

St. Nicholas, The Century Company, New York City.

The Literary Digest, Funk & Wagnalls Company, New York City.

Youth's Companion, Perry Mason Company, Boston, Mass.

Current History, New York Times Company, New York City.

Among especially valuable reference works are the following:

The World Almanac and Encyclopedia (The Press Publishing Company, New York City).

The Statesman's Year-Book (The Macmillan Company, New York City).

The World Book (W. F. Quarrie & Co., 86 E. Randolph St., Chicago), an encyclopedia in eight volumes for young people.

The Book of Knowledge (The Grolier Society, 2 W. 45th St., New York City), an encyclopedia in twenty volumes for young people.

Compton's Pictured Encyclopedia (F. E. Compton & Co., 58 E. Washington St., Chicago), an encyclopedia in eight volumes for schools.

Your class can also purchase some publications by the government, while many may be obtained without charge by writing to your congressman or senator. If you write to the Superintendent of Public Documents, Washington, D. C., you can secure a list of those issued.

III. Principal Peoples of North America

The Indians. — The early white settlers of North America were greatly deceived regarding the numbers of Indians in the regions that they visited. Although the Indians were very thinly scattered over large areas, their natural routes of travel were the same as those of the white man — the waterways. These were selected as sites for their villages, for they furnished drinking water and fish and permitted easy travel by canoe for hunting or war or barter. Nearly all the early missions, forts, and trading posts were thus located. Many explorers knew nothing of the country lying back of the rivers and rashly concluded that Indian villages were as numerous there as along the streams.

Their number and distribution

We now know that people who depend for their living mainly upon hunting and fishing need a large area from which to get their food. In the eastern half of the United States, it is probable that an Indian village of 100 persons required at least 100 square miles of hunting and fishing grounds and possibly even 200 or 300. Where corn, beans, yams, and other vegetables were raised, less land would be required. If each Indian required two square miles of land to supply him with food and clothing, how many Indians might there be in the eastern half of the United States?

There were probably not more than 1,000,000 Indians in North America north of the Rio Grande River at the time when

Columbus discovered America. At the present time there are 347,000 in the United States and about 120,000 in Canada. There have always, however, been far greater numbers in Mexico and Central America.

Some of the early tribes lived a primitive life, but others had advanced far toward civilization. The primitive tribes raised Indian corn, pumpkins, and tobacco; they baked pottery; used tools and weapons made of stone; and lived in villages.

The character of their civilization

Indians that were more nearly civilized lived in the southwestern part of what is now the United States, in Mexico, and in Central America. Though much of this region is arid, the Indians raised crops by irrigation and built houses of stone and sun-dried brick. These tribes lived in villages or *pueblos*, as do many of the more advanced peoples in arid sections.

The most noted among the Indians of Mexico were the *Aztecs*, who lived in and near the region where the City of Mexico now stands. They had a much better government than other North American tribes; they mined gold and silver and made various articles out of these metals; they wove blankets, and ornamented their pottery and their buildings in an artistic manner.

All these Indians, for the most part, lived the quiet life of the farmer. They preferred peace to war, and a settled home to the nomadic life of the hunter.

Although some tribes thus approached civilization, the Indians, as a race, never became a powerful people. There are several reasons for this.

Why they never became more powerful

One is that instead of forming a union and living at peace with one another, they were divided into many independent tribes. Each tribe had a certain area over which it could roam and hunt; if it went beyond this, war might follow. War very often did follow. Thus they were constantly weakened by fighting.

1. The frequency of war

© *E. M. Newman*

Fig. 15. — A portion of a Pueblo Indian village on a mesa

In New Mexico and Arizona Indians known as *Pueblo* Indians (Spanish for "village") live in villages the houses of which are made of stone and *adobe* or dried mud. Their cultivated fields, many of which are irrigated, are on the more level land below.

The level nature of a large part of the country greatly increased this danger of war, and prevented any one tribe from advancing in civilization much beyond its neighbors. Had the surface of North America been very mountainous, there might have been some places where a tribe would have been protected by surrounding mountain walls. Then these Indians might have devoted

themselves to other work than war; and they might even have collected wealth and developed important industries.

But the vast plains of the Mississippi Basin and the extensive plains and low mountains of the East afforded little protection. If any one tribe had built good homes and collected treasures within them, the neighboring Indians would surely have attacked them. The Aztecs were constantly in danger from this source. The fact, however, that they were partly protected by mountains and deserts was one of the reasons why they became more civilized than the Indians of the Northeast.

The fact that the Indians had no domestic animals for use in agriculture was another reason why they did not make more progress. The horse, cow, ass, sheep, goat, and hog are of great service in supplying food and materials for clothing or for helping in agriculture. Without them farm work becomes severe drudgery, because it is then necessary to do everything by hand. Since the Indians had few of these animals to help them, they could do but little farming. Since they made so little use of the land and were therefore widely scattered, it became easy for the white man to take possession of the territory which they had occupied. The white man felt that he was justified in doing this because he could make better use of the soil, the forests, and the minerals. Do you think he was right?

2. The lack of domestic animals

Instead of roaming about, as many formerly did, the Indians are now limited to certain territory assigned to them by our government, or have become American citizens and live as other citizens do.

The Spaniards. — There was great excitement in Europe when it was proved that there were vast territories on this side of the Atlantic held by uncivilized people. America was pictured as containing all sorts of treasures, and European nations vied with one another in fitting out expeditions to take possession of them.

Spain naturally led, for in the sixteenth century it was one of the most powerful nations of Europe; and it was the Spaniards who had sent Columbus on his voyage of discovery. The section reached by the Spaniards had a climate enough like their own to make them feel at home there. Soon they came into possession of most of South America, Central America, Mexico, and the southwestern part of what is now the United States. They had one advantage over the English and French, who settled farther north: the portion of the continent which they explored is so narrow that they easily crossed it. Thus they were able to settle both the Atlantic and the Pacific coasts. It was largely because of this fact that they took possession of the western coast as far north as San Francisco.

The portion of the continent taken by them

Why did they not hold this territory? Partly because they came here to get rich and return home, rather than to make permanent homes for themselves. With that object they sought only for gold, silver, and pearls. Few of them settled in America. The wealth and energies of the Spaniards were also wasted for many years in the wars of the Emperor Charles V and King Philip II. Largely for these reasons, their control over this territory did not grow stronger as the years passed; and at the first opportunity the natives threw off their rule. The Spanish now hold no territory in the New World. The chief reminder of their former power

Why they did not keep this territory

is the Spanish language, which is spoken in most of the countries of the New World south of the United States.

The French. — The French began their settlements in a very different quarter, being early attracted to our coast by the excellent fishing on the Newfoundland Banks (p. 188). Soon the fur trade with the Indians proved profitable, and the French took possession of Nova Scotia and the region along the St. Lawrence River and the Great Lakes.

Location of their settlements

The value of the fur trade, together with a desire to convert the Indians to Christianity, led them as far as the headwaters of the Mississippi River. Making their way southward to the mouth of that river, they took possession of a large part of the Mississippi Valley, calling it Louisiana in honor of their king, Louis XIV. Trace on the map (Fig. 17) the route they probably took in their canoes from Quebec to the mouth of the Mississippi River, and estimate the distance.

In order to hold this vast territory, they established a chain of trading posts and forts from the Gulf of St. Lawrence to the Gulf of Mexico. One of the most important of these forts was built where Pittsburgh now stands. Many places in the St. Lawrence and Mississippi valleys still have French names; for example, Lake Champlain, Marquette in Michigan, La Salle in Illinois, St. Louis, and New Orleans. Can you name others?

The climate of the French territory was, on the whole, more favorable than that of the Spanish country; for, though rather severe in the St. Lawrence Valley, it was neither hot enough to make people lazy, nor so cold as to discourage them. One of the greatest difficulties was that the few scattered settlers were unable to protect all the vast territory to which the French laid claim.

Some reasons why they lost this territory

The English. — The Spanish and French left only a narrow strip along the Atlantic coast for other nations. Among those who made settlements there were the Dutch in New York and the Swedes in Delaware; but the English soon captured New York City (then called New Amsterdam) from the Dutch, and extended their settlements along most of the coast from Florida to Nova Scotia.

Location of their earlier settlements

In several respects the portion that fell to the English seemed no more desirable than that held by the Spanish and French. Yet English-speaking peoples have managed not only to hold this, but also to add to it many of the possessions of the other two. At the present time the control of the entire continent, except Mexico, Central America, and a few small islands, is in the hands of either the United States or Great Britain. There is to-day a greater mixture of peoples in North America than in any other continent. In the United States alone there are thousands of emigrants from every nation of Europe and from the leading countries of Asia. English-speaking people have so ruled our country as to make it a place of refuge for all who are willing to work and desire a comfortable living.

Territory occupied by English-speaking people

There are, of course, several explanations of this remarkable result. Differences in the characters of these three races, no doubt, partly account for it. Yet there are other causes also, as is shown in the following paragraphs.

Reasons for its increase

The English emigrated to North America in greater numbers than the French or Spanish, for England was the most densely

populated of these three European countries. Not only were they thus the most numerous, but their new homes were in many respects the most favorably located; for the temperate climate of the central portion of North America is one of the best in the world for the production of energetic people. The warm summers allowed abundant harvests, while the long, cold winters forced the settlers to work hard in order to store up supplies for the cold season; yet, although they had to work a great deal, they still had energy left to use their leisure to good advantage.

Again, the fact that the English were hemmed in by forest-covered mountains on the west, and by the French and Spanish on the north and south, also proved an advantage. On that account, they were kept close together; and when wars arose, they were better able to mass their forces.

Facts to be especially well fixed. — 1. Reasons why the Indians never became more powerful in North America. 2. The chief European nations who sent settlers to America, their modes of life, and their success as colonists.

Problems for independent study. — 1. The three leading purposes in the settlement of the continent were to till the soil, hunt for gold, and trade in furs. Which of these, in the long run, was the most profitable? Why? 2. Find out what sections of North America are now occupied by other than English-speaking people. See under "Population" in *The World Almanac;* World Book, vol. 6, p. 4256; *The Statesman's Year-Book* (Macmillan). 3. Debate this question: *Resolved,* that the treatment of the Indians by the United States Government has been wise. National Geographic Magazine, 1915, vol. 27, pp. 72–87; Outlook, vol. 109, p. 747; vol. 116, p. 136. 4. In two prominent cities in the former French territory the French language is still extensively spoken. What are they, and why has that language survived better there than elsewhere? Encyclopædia Britannica, vol. XXII, p. 727; vol. XIX, p. 527; Carpenter, F. G.: *North America* (edition 1922), pp. 175–176, 440–442 (American Book); Johnson, C.: *Highways and Byways of the Mississippi Valley,* pp. 6–17 (Macmillan); Whitbeck, R. H.: *High School Geography,* pp. 476–478 (Macmillan).

How to use an encyclopedia. — Look carefully at the backs of the volumes of any encyclopedia. You will see that the books are arranged alphabetically, and that each volume contains all subjects beginning with certain letters indicated on its back. For example, one volume may contain all subjects beginning with any letters from *A* to *Blight.* In using the encyclopedia called *The World Book,* to find more facts about Seattle, you turn to the volume having on the back the words *Richard to Tides.* Since the word *Seattle* begins with *S,* which stands in the alphabet between *R* and *T* it will be found in this volume.

Most encyclopedias have headings of some sort that, like the headings in this geography, suggest what is contained in the paragraphs that follow. In case there are none, it is a good plan to glance at the topic sentence of each paragraph, which is usually the first sentence of that paragraph, to find what it deals with.

IV. The United States

Location and area. — On Fig. 2 we see that the United States occupies the central part of North America, extending from ocean to ocean.

Aside from Alaska, which belongs to us, the only countries on our north are Canada, Newfoundland, and Greenland. On our south are Mexico and the several small countries of Central America and the West Indies. Trace our boundaries on the north and south. What boundaries are natural? What are artificial?

The area of the United States is about 3,000,000 square miles, which is about four times the area of Mexico. Yet ours is not the largest country on the continent, for

the area of Canada is greater than that of the United States and Alaska combined.

Population. — Our population in 1920 was 105,711,000. The population of Canada is a little less than 9,000,000, of Mexico about 14,000,000, and of Central America and the West Indies about 16,000,000. Not only have we more inhabitants than the other countries of North America combined, but we have more than all the other countries of North and South America put together. Ours has plainly been the favorite country for settlers in the New World.

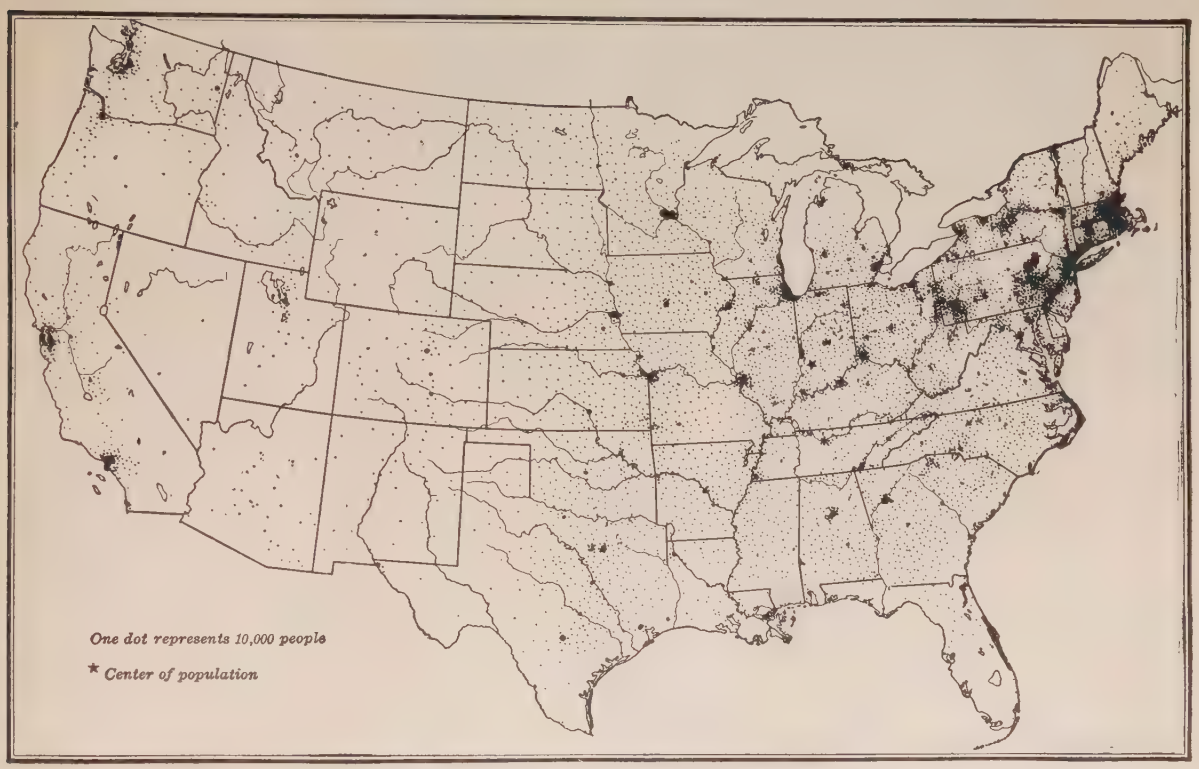


Fig. 16. — Distribution of population in the United States

Each dot on this map and the population maps of the sections of our country represents 10,000 people. As in the case of Fig. 10, where each dot represents ten times as many people as in the case of this map, it must be remembered that the people are distributed more or less evenly over the areas between the dots, except in the cases of cities. Cities of 20,000 or more are represented by two or more dots in a group.

Reason for studying the United States in sections. — It is therefore evident that the United States is the most important country in the Western Hemisphere; in fact, it is in many ways the leading country in the world. Our country is so large that it is necessary to divide it into sections in order to study it in proper detail. Accordingly, the states have been divided into four groups or sections. The first of these is the Northeastern States, commonly spoken of as "the East." The six of these eleven states that lie to the east of New York are sometimes referred to as "New England." The other groups, in their order, are the North Central States, or "the Middle West"; the Southern States, or "the South"; and the Western States, or "the West." Not only are the states within each group closely related in location, but most of them are similar to one another in surface features, climate, and

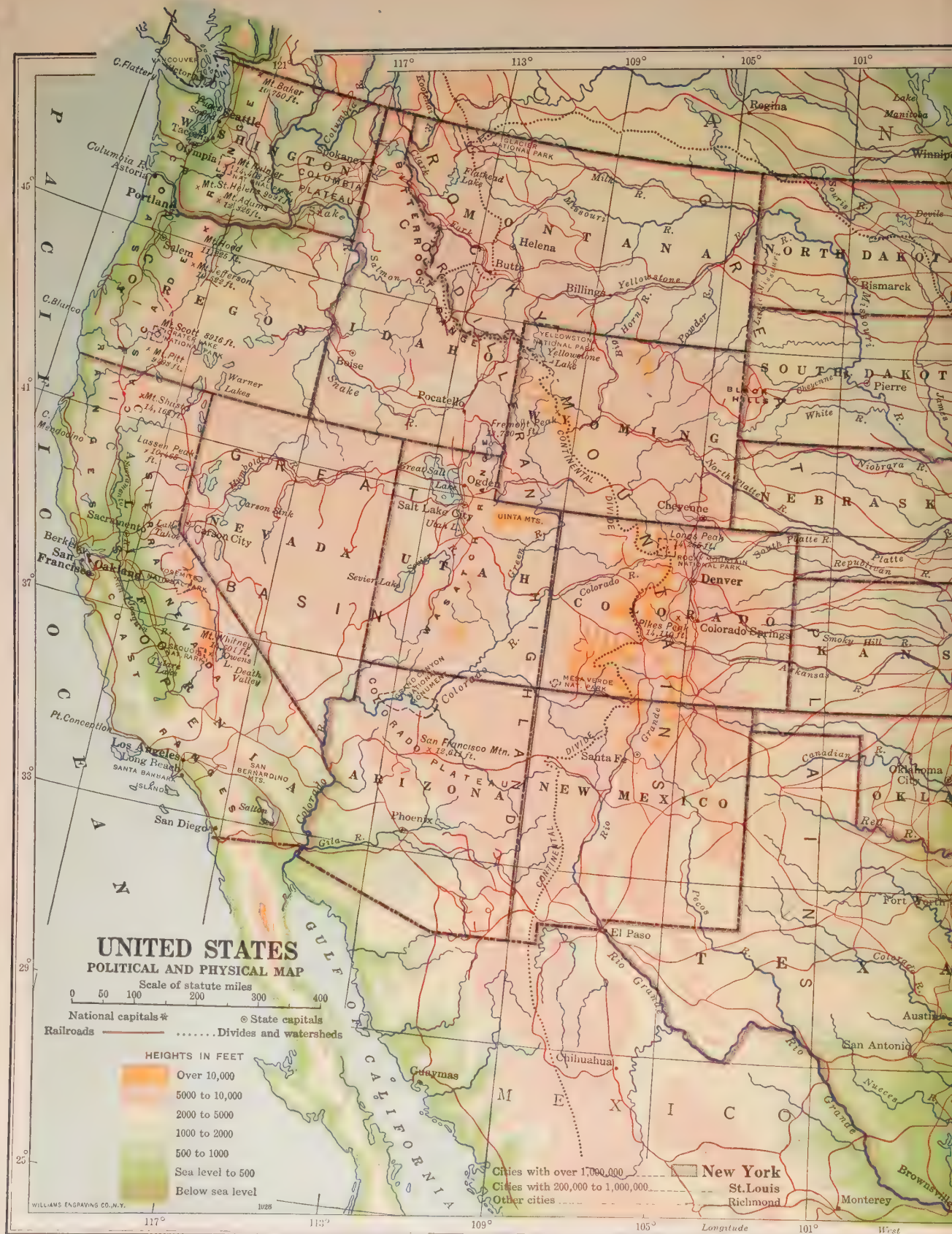
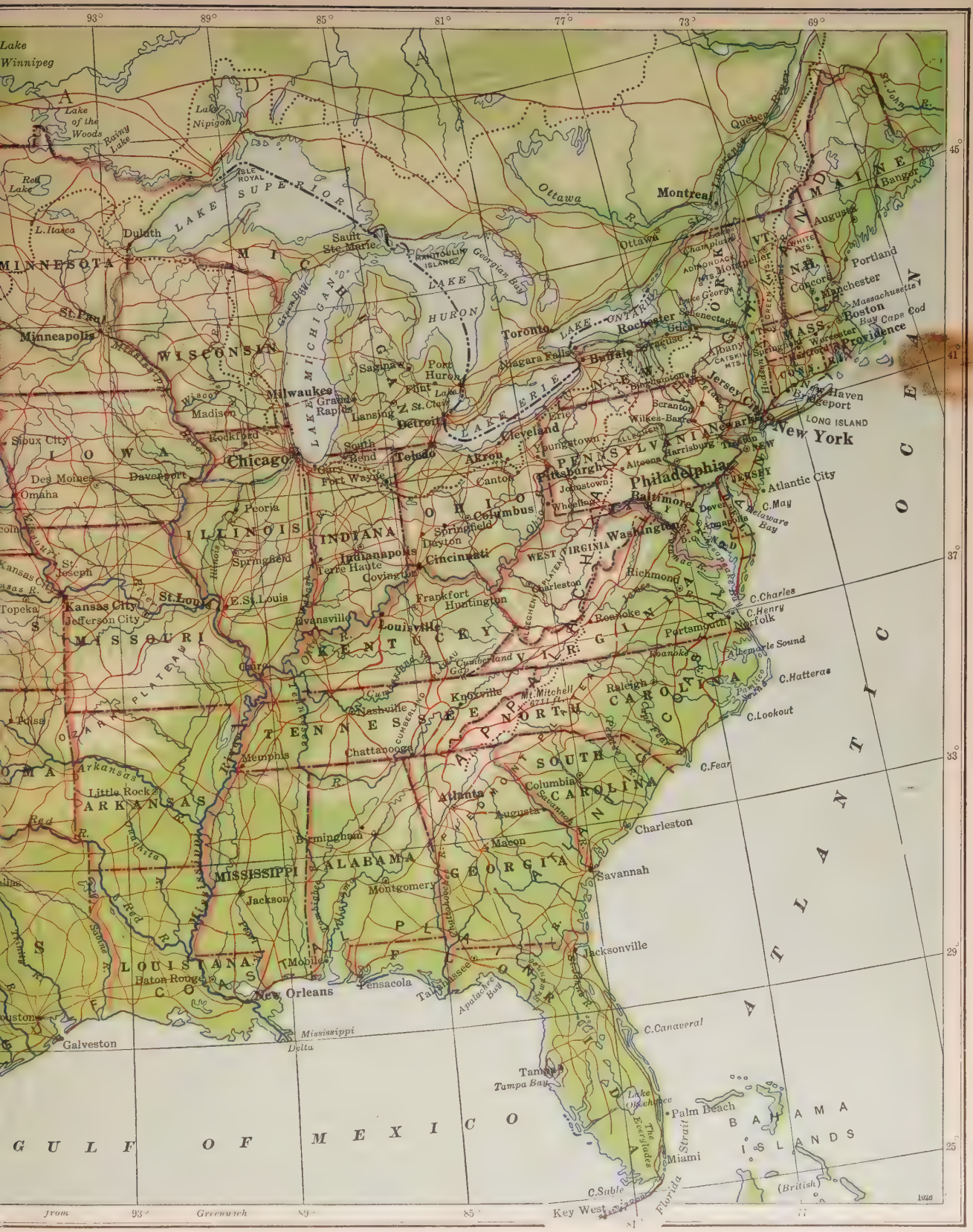

UNITED STATES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300 400
National capitals ★ ◎ State capitals
Railroads ——— ..... Divides and watersheds
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
Cities with over 1,000,000 New York
Cities with 200,000 to 1,000,000 St.Louis
Other cities Richmond
WILLIAMS ENGRAVING CO., N.Y. 1026
117° 113° 109° 105° 101°
Longitude West
PACIFIC OCEAN
GULF OF CALIFORNIA
MEXICO
CANADA
Regina
Lake Manitoba
Winnipeg
NORTH DAKOTA
Bismarck
SOUTH DAKOTA
Pierre
NEBRASKA
Denver
Colorado Springs
KANSAS
Oklahoma City
OKLAHOMA
TEXAS
Austin
San Antonio
Fort Worth
El Paso
Monterey
Chihuahua
Guaymas
Phoenix
Santa Fe
NEW MEXICO
ARIZONA
UTAH
NEVADA
COLORADO
WYOMING
MONTANA
IDAHO
OREGON
WASHINGTON
Portland
Seattle
Spokane
Salem
Boise
Helena
Butte
Billings
Cheyenne
Salt Lake City
Ogden
Pocatello
Reno
Carson City
Sacramento
San Francisco
Berkeley
Oakland
Los Angeles
Long Beach
San Diego
Mt. Whitney 14,501 ft.
Death Valley
Mt. Baker 10,750 ft.
Mt. Rainier 14,363 ft.
Mt. St. Helens 9,671 ft.
Mt. Adams 12,307 ft.
Mt. Hood 11,225 ft.
Mt. Jefferson 10,522 ft.
Mt. Scott 8916 ft.
Mt. Pitt 9,495 ft.
Mt. Shasta 14,161 ft.
Lassen Peak 10,465 ft.
Warner Lakes
Great Salt Lake
Uinta Mts.
Sevier Lake
Carson Sink
Humboldt R.
Mono Lake
Owens L.
Salton Sea
San Bernardino Mts.
Santa Barbara Islands
Pt. Conception
C. Mendocino
C. Blanco
C. Flattery
Columbia R.
Snake R.
Colorado R.
Green R.
Gila R.
Rio Grande
Yellowstone R.
Missouri R.
Platte R.
Arkansas R.
Canadian R.
Red R.
Brazos R.
Nueces R.
Pecos R.
Powder R.
Big Horn R.
Milk R.
Marias R.
Flathead Lake
Yellowstone Lake
Fremont Peak 13,750 ft.
Longs Peak 14,255 ft.
Pikes Peak 14,110 ft.
San Francisco Mtn. 12,611 ft.
Columbia Plateau
Colorado Plateau
Great Basin
Rocky Mountain Trench
Continental Divide
Cascade Range
Sierra Nevada
Coast Ranges
Yosemite Park
Grand Canyon National Monument
Mesa Verde Nat. Park
Glacier National Park
Yellowstone National Park
Rocky Mountain National Park
Black Hills

Fig. 17


93°
89°
85°
81°
77°
73°
69°
45°
41°
37°
33°
29°
25°
Lake Winnipeg
Lake of the Woods
Rainy Lake
Lake Nipigon
Red Lake
L. Itasca
Dulath
MINNESOTA
St. Paul
Minneapolis
WISCONSIN
Milwaukee
Madison
Sioux City
IOWA
Des Moines
Davenport
Omaha
Chicago
Rockford
Peoria
ILLINOIS
Springfield
St. Joseph
Kansas City
Jefferson City
St. Louis
E. St. Louis
MISSOURI
Topeka
Tulsa
Arkansas
Little Rock
ARKANSAS
Memphis
TENNESSEE
Nashville
Chattanooga
Knoxville
Louisville
INDIANA
Indianapolis
Terre Haute
Cincinnati
Evansville
Frankfort
Huntington
KENTUCKY
Cumberland Gap
Mt. Mitchell 6711 ft.
Red R.
Shreveport
MISSISSIPPI
Jackson
Birmingham
ALABAMA
Montgomery
Mobile
LOUISIANA
Baton Rouge
New Orleans
Galveston
Houston
Pensacola
Tallahassee
Apalachee Bay
Tampa
Tampa Bay
Lake Okeechobee
Palm Beach
Miami
The Everglades
Florida Strait
BAHAMA ISLANDS
(British)
Key West
GULF OF MEXICO
ATLANTIC OCEAN
Mississippi Delta
C. Sable
C. Canaveral
C. Fear
C. Lookout
C. Hatteras
C. Charles
C. Henry
C. May
Delaware Bay
Albemarle Sound
Pamlico Sound
Atlantic City
Jacksonville
Savannah
Charleston
Macon
Augusta
Columbia
Atlanta
SOUTH CAROLINA
NORTH CAROLINA
Raleigh
Roanoke
Norfolk
Portsmouth
Richmond
Washington
WEST VIRGINIA
Charleston
Pittsburgh
Johnstown
Altoona
Harrisburg
Philadelphia
Baltimore
Wilmington
Dover
Annapolis
PENNSYLVANIA
Scranton
Wilkes-Barre
Trenton
NEW JERSEY
New York
LONG ISLAND
Newark
Jersey City
Bridgeport
New Haven
Hartford
Providence
Boston
Buzzards Bay
Cape Cod
Worcester
Springfield
MASS.
Albany
Troy
Schenectady
Utica
Rochester
Syracuse
Buffalo
Niagara Falls
Toronto
LAKE ONTARIO
LAKE ERIE
Erie
Cleveland
Akron
Youngstown
Canton
Toledo
Fremont
Sandusky
Detroit
Flint
Saginaw
Port Huron
Grand Rapids
Lansing
St. Clair
Lake St. Clair
LAKE MICHIGAN
LAKE HURON
Georgian Bay
Manitoulin Island
Sault Ste. Marie
LAKE SUPERIOR
Isle Royal
Thunder Bay
Ottawa
Montreal
Quebec
St. Lawrence R.
St. John R.
Bangor
Augusta
Portland
Concord
Manchester
Lake Champlain
Lake George
Adirondack Mts.
Green Mts.
White Mts.
VT.
N.H.
MAINE
Burlington
Montpelier
Rutland
Saratoga
Schenectady
Catskill Mts.
Hudson R.
Berkshire Hills
Worcester
Springfield
Connecticut R.
Hartford
New Haven
Bridgeport
Long Island Sound
Newport
Providence
Buzzards Bay
Cape Cod
Boston
Massachusetts
Lake Champlain
Lake George
Adirondack Mts.
Green Mts.
White Mts.
Ottawa R.
St. Lawrence R.
St. John R.
Quebec
Montreal
Ottawa
Toronto
Niagara Falls
Buffalo
Rochester
Syracuse
Albany
Troy
Schenectady
Utica
Hudson R.
Berkshire Hills
Worcester
Springfield
Connecticut R.
Hartford
New Haven
Bridgeport
Long Island Sound
Newport
Providence
Boston
Buzzards Bay
Cape Cod

Questions on Fig. 17. — 1. Trace the divides or watersheds which separate the Mississippi Valley from regions to the west, north, and east. 2. In the tables of areas given in this book, the areas of states are combined land and water areas. Show how the area of the state of Utah would be affected if only land surface were considered. In the case of what other states would you expect the land area to differ greatly from the total area of land and water together? 3. There are two rivers on this map bearing the name "Colorado River." Locate them. 4. Why would it be impossible for any river on this map to rise in a green area, cross a brown area, and return to a green area? 5. Compare this map with Fig. 1 and point out on it the different highlands and lowlands there named. 6. If you wish to look up smaller places than are named on this map, refer to Fig. 499.

---

the character and occupations of their inhabitants.

Importance of watching the scale of maps. — As you study each of these sections, a very important point to notice is the *scale* to which each map is drawn. Some of the maps in this book represent areas hundreds of times larger than those represented by even larger maps. Compare, for example, the area of New England in Fig. 2 with that of the same section in Fig. 32. In Fig. 2 an inch represents 675 miles. In Fig. 32 an inch represents seventy-five miles. According to that scale, how long is the state of Connecticut? How wide? Find what the scale is in Fig. 77. Using this scale, find the distance from Chicago to Buffalo. Using both maps, find the distance from Cleveland to Boston, by way of Albany. When studying a map, whether in this book, on the wall, on a globe, or in an atlas, it is always important first to observe its scale.

Office of Farm Management, U. S. Dept. of Agric.

Fig. 18. — Annual rainfall of the United States

What portions of the United States receive more than eighty inches of rainfall on the average each year? Name the states partly in the humid and partly in the semi-arid regions. What states have large arid regions?

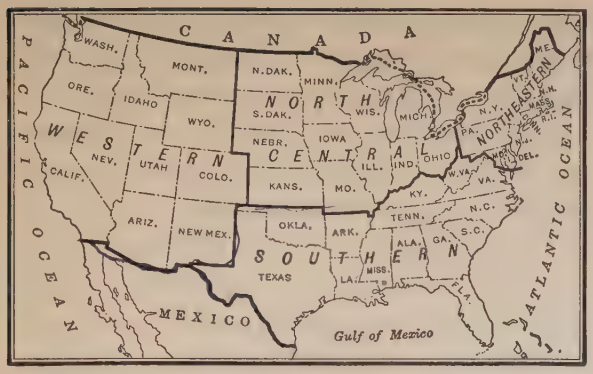


Fig. 19. — Division of the United States into sections employed in this book

Fig. 20. — Division of the United States into sections employed by the Bureau of the Census

The four grand divisions or sections of the United States outlined in the left-hand map are those used throughout this book both in maps and in text. This method of grouping the states helps us to study together states which are engaged in similar industries. Thus the Corn Belt (Fig. 70) lies almost entirely in the North Central States, which are divided into two sections in the right-hand map; and the Cotton Belt (Fig. 110) is included almost entirely in the Southern States, which in the right-hand map are divided into three sections. At rare intervals, however, when we wish to refer to smaller groups of states, it is convenient to use the more complicated system of division shown by the right-hand map.

1. The Northeastern States

State	Area in Square Miles	Population (1920)	Largest City	Population (1920)
Connecticut	5,000	1,381,000	New Haven	163,000
Delaware	2,400	223,000	Wilmington	110,000
District of Columbia	70	438,000	Washington	438,000
Maine	33,000	768,000	Portland	69,000
Maryland	12,300	1,450,000	Baltimore	734,000
Massachusetts	8,300	3,852,000	Boston	748,000
New Hampshire	9,300	443,000	Manchester	78,000
New Jersey	8,200	3,156,000	Newark	415,000
New York	49,200	10,385,000	New York	5,620,000
Pennsylvania	45,100	8,720,000	Philadelphia	1,824,000
Rhode Island	1,250	604,000	Providence	238,000
Vermont	9,600	352,000	Burlington	23,000

Questions. — 1. Which of the above states form the district commonly known as *New England* (p. 25)? 2. Compare the population of the largest *city* in the above list with the total population of the eight *states* in the list that have the smallest populations.

Density of population of these states. — Fig. 21 shows how dense the population of these states is. New York City, with its 5,600,000 inhabitants, is represented by 560 of these dots, which are here so close together that they overlap. West of it, across the Hudson River, are Newark, Jersey City, Hoboken, Elizabeth, Paterson, and other cities that together would require more than a hundred additional dots if these could be shown clearly so close together. Make a drawing of New York harbor and vicinity and show upon it the location of these places. There are many other large cities in these states. Point out the groups of dots that represent Philadelphia, Baltimore, Washington, Boston, Providence, Pittsburgh, Buffalo, Rochester. New York is the most

populous state in the Union and Pennsylvania is next. Note how small the area of this group of states is compared with that of our entire country; yet it contains more than one fourth of our entire population, and averages 172 persons to the square mile. Find the average per square mile for the United States by dividing the total population in millions by the total area in millions of square miles (p. 13).

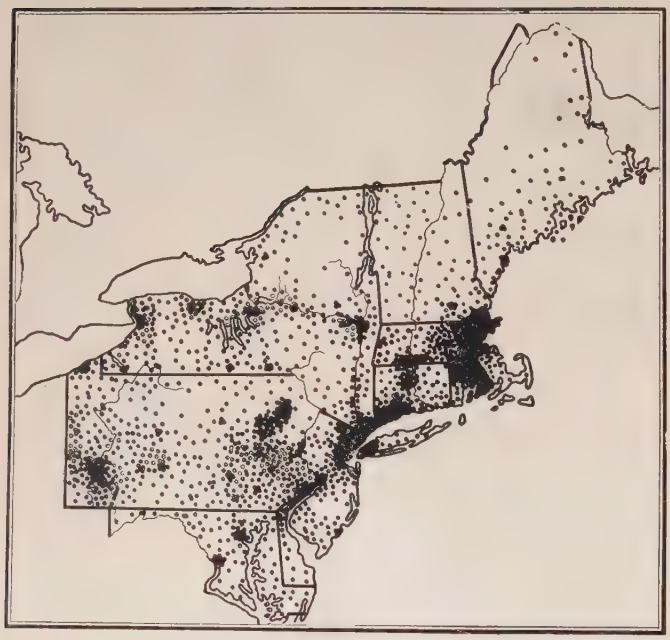


Fig. 21. — Distribution of population in the Northeastern States

Each dot represents 10,000 people.

Reasons for so many inhabitants. — One explanation of so dense a population is the advantages which these states enjoy for transportation. They are on the border of the busiest ocean in the world, with Europe and its population of 453,000,000 on the other shore. West of these states are the North Central and the Western States, extending all the way to the Pacific Ocean and containing very progressive inhabitants. They lie, therefore, directly between two of the busiest parts of the earth, the people on each side wanting countless things from the other side of the ocean in the way of food, raw materials for manufacture, and finished articles.

Advantages for transportation

1. Importance of the location of these states

The Northeastern States are aided in meeting this demand by the ease with which goods can be transported in both directions. Modern steamships can easily cross the Atlantic in a few days, and there are direct lines of communication with the Middle West.

2. Their ease of communication with the states farther west

a. The first easy route across the Appalachian Highland

There was a time when traffic with the West was greatly hindered by the Appalachian Highland. Judging from Fig. 32, how much of the surface seems hilly or mountainous? Note the pass across the Highland along the Mohawk River. At first wagon roads were put through the Highland; then it was decided that a canal could be dug connecting the Hudson River and Lake Erie. The easiest route lay along the Mohawk River between the Adirondack Mountains and the Catskills; the Erie Canal, following that course from the Hudson River to Buffalo, was completed in 1825. It gave New York the lead over other coast cities for trade with the West by way of the Great Lakes. Estimate the distance from New York to Duluth by this route (Fig. 17).

Then railroad building began, and New York City gained an additional advantage. The route followed by the Erie Canal required that trains climb only 500 feet to cross the highland, while the Allegheny Plateau in Penn-

b. The use of this route by the old Erie Canal and by railroads

sylvania compels them to climb 2,000 feet. Accordingly, railroads from the Hudson River to Lake Erie were among the first lines to be constructed. Others rapidly followed, one of the best known being the Pennsylvania Railroad, which was built from Philadelphia to Pittsburgh by holding to the valleys and occasionally tunneling through the ridges.

All the large coast cities now have extensive railroad connection with the Middle West. In Fig. 233 trace the main lines from several of them, and note what cities they pass through. Which route has the most large cities? Recently the New York State Canal has been dug between Troy and Buffalo, to take the place of the old Erie Canal and to accommodate much larger boats. Although the canal is not yet extensively used, it is likely to increase the advantage of New York to a considerable extent.

© *Ewing Galloway*

Fig. 22. — A portion of the harbor at Buffalo

Lake Erie is seen in the distance, as is also a portion of the harbor protected by a breakwater. In the foreground is a large ore boat that has just arrived from Lake Superior and is being unloaded. The huge machines that you see lift the ore from the hold of the boat through the openings in the deck called hatchways and dump it into the railway cars shown on the right. These cars will take the ore away to the numerous blast furnaces in this region.

One thing more is necessary in order that these states may make full use of their other advantages for transportation. That is the large number of harbors so well inclosed that vessels anchored in them are safe from storms, so deep that the largest vessels can enter them, and so free from ice that they are open at all seasons. This need is admirably met in the great coast cities. We have already seen (p. 11) how nature has prepared the way. Man has completed what nature has so well begun by removing minor obstructions and by constructing wharves in each of the leading ports so that a large number of ships can dock at a time.

3. Excellence of their harbors

A second reason for so many inhabitants is the abundance of power for manufacturing, particularly of power supplied by coal. Coal is used for many other purposes than heating and cooking. It is valuable for making illuminating gas, for smelting iron, and for producing steam to run locomotives and the machinery of factories. It is this last use of coal that ranks it clearly as the most useful of all minerals and that has made possible the dense population in these states. If the coal supply were to fail, most of the factories would stop and a considerable part of the population would probably be compelled to go elsewhere to make a living.

Abundance of power for manufacturing

1. Coal supply

a. Our dependence on coal

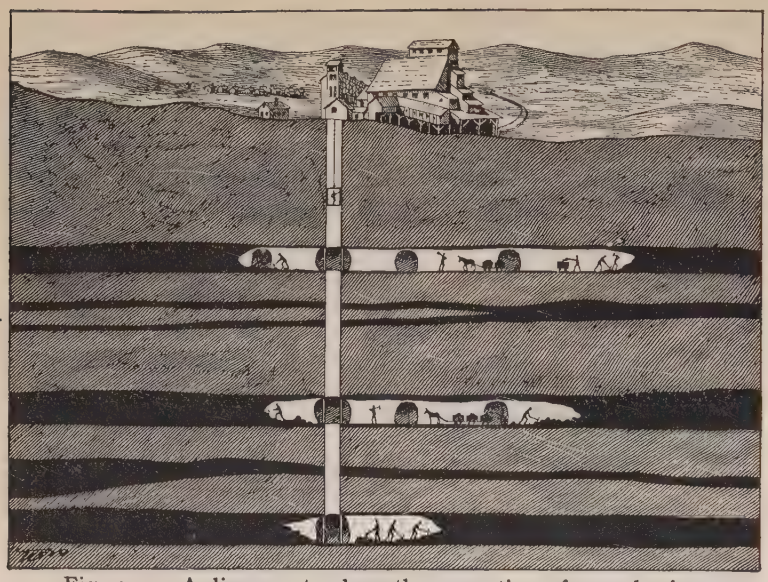


Fig. 23. — A diagram to show the operation of a coal mine
Note the veins of coal; the tunnels; the cross tunnels; and the vertical shaft, with its *cage* or elevator.

According to Fig. 4, you can see that about half of our states produce some coal; but the output from Pennsylvania is nearly a third of that from our entire country. Nearly 700,000 tons are mined every day in this one state, and more than 300,000 men are employed in and about its mines. If the miners' families average at least four members each, as they probably do, how many persons are directly dependent on these mines for a living? About what portion of the entire population of the state?

b. Its abundance in Pennsylvania; and the kinds mined

Anthracite, or hard coal, comes from the eastern part of Pennsylvania, in the neighborhood of Scranton and Wilkes-Barre and to the south of these cities. This is the only important anthracite field now being worked in the world. In western Pennsylvania about Pittsburgh, as we have learned, bituminous coal is mined. About one third of the state's output of coal is anthracite, the remainder being bituminous coal from this western area.

While anthracite is more difficult to ignite than soft coal, it is cleaner to handle, makes a hotter fire, and produces less smoke; for these reasons it is preferred for many purposes. Which kind is used in your home, and why was it selected?

© Detroit Publishing Co.

Fig. 24. — Miners and breaker boys at a coal mine in Pennsylvania
This mine is in eastern Pennsylvania. What variety of coal is mined here?

The miner's task is to get this coal to the surface of the earth ready for distribution. His method is suggested in Fig. 23, where you see a shaft sunk through several beds or seams of coal, and containing an elevator for the use of men and of small coal cars. You can see some miners and also some mules at work below. What are they doing? The tunnels form streets that parallel one another and cross at right angles, much as do those of a city, and a man goes from one layer of coal to another in the elevator, just as he uses an elevator to go from one floor to another in a building.

c. How the miners work

Some coal mines are lighted by electricity, but even in these the workmen more often furnish their own light by means of lamps fastened to their caps. The miners drill holes in the coal beds and break the coal away by blasting, after which the larger lumps are broken into smaller pieces. Then the coal is shoveled into cars, drawn to the shaft by mules or electric engines, and hoisted to the surface.

Perhaps some of the difficulties and dangers of such work occur to you. Do you see how men could become trapped in such a mine? Also that the mine must be ventilated? The need of good ventilation is much greater there than in ordinary buildings, for deadly gases must constantly be driven out.

While this part of the Northeastern States supplies a vast amount of coal, it produces other kinds of fuel as well. In the rocks of the plateau along the western border of the Appalachian Highland oil and gas are found. *Petroleum*, as the oil is generally called, means rock oil — a name that suggests its origin. The way in which this is obtained will be discussed on p. 114, in connection with the Southern States, where oil is much more plentiful. Like petroleum, *natural gas* is obtained by boring down to a rock layer where it has been formed. Since the gas is under pressure and very light, it is forced to the surface. It is then piped to houses and factories. Many homes in Buffalo, Pittsburgh, and other cities in western New York and Pennsylvania and in West Virginia are heated by natural gas, and many factories use it as fuel. The western parts of Pennsylvania and New York were once one of the principal sources for these two products;

2. Supply of oil and natural gas

© *Underwood and Underwood*

Fig. 25. — Drilling for a blast in an anthracite mine at Scranton, Pennsylvania

A hole is drilled some three or four feet into the coal; into this a charge of powder is placed and discharged by a fuse or an electric spark. Thus the coal is loosened. The coal is so hard that it cannot be mined so easily as soft or bituminous coal. The anthracite coal occurs beneath only about 480 square miles of land. The difficulties of mining and the scarcity make anthracite much more expensive than bituminous coal.

© Detroit Publishing Co.

Fig. 26. — Factories and power plants along the gorge of Niagara River

These factories are only a short distance below the Falls. Many of the factories here use water power, the water being brought from above the Falls by a canal. The building at the foot of the bluff is a power plant; water is conducted to it through the large pipes.

Piedmont Plateau (Fig. 32) in Pennsylvania and Maryland. This is a low, hilly table-land of hard rock, which slopes toward the sea. Nearer the sea is a low plain composed of much softer rock and known as the Atlantic Coastal Plain. From New York to Alabama the streams that flow from the Piedmont Plateau across the Coastal Plain to the sea have dug farther into the soft layers of the plain than into the hard rock of the plateau, and for that reason have formed rapids and falls along the boundary between these two areas. There are so many such falls that this boundary is called the Fall Line. The importance of this water power for manufacturing is suggested in Fig. 112 by the number of cities that have grown up along the Fall Line. Name several of them.

now, however, this region is surpassed by several others (pp. 114 and 150).

Owing to the work of the Great Ice Sheet (p. 9) and to the many mountains

3. Abundance of water power

in these states, water power is found in almost all sections. The most noted source is Niagara Falls, one of the greatest waterfalls in the world. While these falls belong partly to Canada, they furnish an enormous quantity of power to us for manufacturing, which, in the form of electricity, is used in factories even 150 or 200 miles distant.

Water power is also developed from many of the streams that flow across the

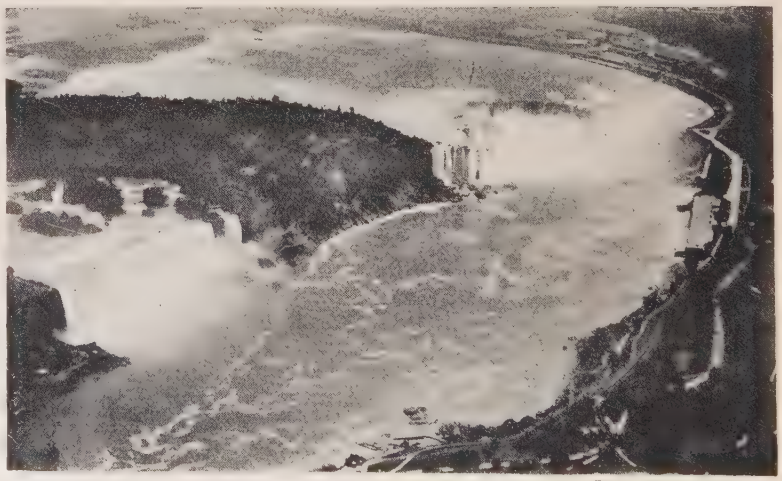


Photo by Major Maxwell

Fig. 27. — An airplane view of Niagara Falls

On the right, on the Canadian side, are the Horseshoe Falls, on the left the American Falls. Goat Island lies between. In what direction was the camera pointed when this photograph was taken? (See Fig. 48.)

Recall the four sources of power that have been named. Unfortunately the raw material most needed in order to make full use of this power is not produced in large quantities within these states. This is iron ore, from which iron and steel are made. Pennsylvania, New York, and New Jersey mine some of it, but the amount is small. Most of what is used here must be obtained elsewhere. This is not difficult, however, for the most valuable iron mines in the world exist along the shores of Lake Superior, whence the ore can be hauled all the way to the south shore of Lake Erie by water. More facts about these iron mines are given on p. 82.

The supply of raw materials for manufacturing

1. Where iron ore is chiefly obtained

Courtesy of U. S. Forestry Service

Fig. 28. — Assembling a raft of logs on the Penobscot River, Maine

The Penobscot River has long been used to float logs to the mills located along its lower course. What city is situated near the mouth? Are these hardwood or softwood logs? Tell how the snows and the spring floods and the current all help to make lumbering cheap in Maine. Where are the markets for this lumber?

There used to be vast forests here; and they are still extensive in the mountainous sections. The dense population, however, calls for an enormous quantity of lumber for such varied purposes as the building of dwellings and the manufacture of furniture, boxes for packing goods, and boats. How great the consumption of wood is for boxes alone is suggested by the fact that a certain book publisher admits spending $30,000 each year for boxes used in packing his output of books.

2. The demand for wood

a. In the form of lumber

Large quantities of wood pulp are also needed for paper, the demand greatly exceeding the supply. Rags were formerly the principal material from which paper was made; but now most of our paper is manufactured from wood, particularly spruce, hemlock, and poplar. By grinding the wood into bits or by use of chemicals, it is reduced to a pulp which is pressed into thin sheets for paper. When one reflects that the term paper includes wrapping paper, pasteboard, writing paper, newsprint, and paper for books and magazines, one realizes what an enormous quantity of wood pulp is needed. About 6,000,000 cords of wood are wanted each year in the United States for paper, a large part of which is used in these states.

b. For paper

The yield of pulp wood per acre varies enormously in different parts of the country and even in the same locality. But in northern New England and eastern Canada five cords per acre is a fair amount. At that rate how many acres of forest are consumed each year in order to meet our demand? How many square miles is that? This estimate is too large, however, for on the Pacific coast, in the Douglas fir region, where the trees are much larger, the yield is sometimes as high as 300 cords per acre. Our country alone cannot meet our requirements for wood pulp; but vast quantities can be obtained from Canada, for there are very extensive forests not far across the boundary.

This section has some important substitutes for wood, particularly for building.

Courtesy of Barre Quarrymen's Association

Fig. 29. — Handling a block of granite, Vermont

The granite block is being hoisted by means of the "block and line" and will be placed on the car, to be taken to the manufacturing plants where it will be shaped and polished.

Clay from which bricks are made is abundant; so also are granite, marble, and slate. At Quincy, near Boston, are some of the oldest granite quarries in the country. Barre, in Vermont, is also noted for its granite; Rutland for its marble; and slate is found in many places. Name several uses of such stone, aside from building.

3. The sources of quarry products

The use of petroleum for fuel is not its only value. There are more than 200 articles of commerce manufactured from it, including ether, gasoline, naphtha, benzine, kerosene, lubricating oil, paraffin, and vaseline. Some of these are valuable in the production of other things: for example, paraffin is used for making candles, wax paper, and chewing gum.

4. Products made from petroleum; how they are secured

In order to obtain these products, the crude petroleum has to be refined. For that purpose it is placed in tanks holding from 600 to 700 gallons each and then heated. The heat causes the oil to evaporate, the lightest part evaporating first, the other parts then following one after another. These vapors are then condensed, and thus the gasoline, kerosene, and other products are obtained separately.

Although large oil refineries have been erected in the South and West, where most of our crude oil is now produced (pp. 114 and 150), much of the refining is still done in the Northeastern and the North Central States. One of the

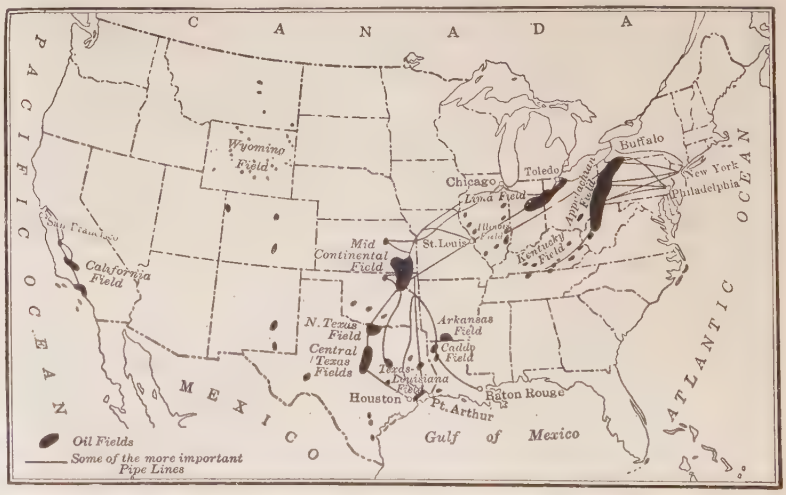


Fig. 30. — Oil fields and pipe lines in the United States

The size of the field bears little relation to the amount of oil produced. The life of an oil field is short. The wells in the Appalachian and the Lima fields are now producing comparatively little oil.

chief centers for this industry is Bayonne, in New Jersey, across the harbor from New York City; other centers are Philadelphia, Baltimore, Chicago, and Cleveland. Some of the petroleum must, therefore, be transported long distances. As it would be very expensive to haul it by rail, a cheaper way has been found, which is by means of pipe lines laid underground (Fig. 30). The pipes are from four to eight inches in diameter; the crude oil is forced through them by means of pumps placed twenty to thirty miles apart. Some of these pipe lines run only from the great Southern oil fields to the Gulf coast, the oil being refined there or shipped by steamer to the Northern refineries; but others lead all the way to Chicago and even to Bayonne. In view of the large number of products manufactured from petroleum, what reasons can you see for locating refineries so far from the oil wells?

Extent and nature of the manufacturing. — While many of the raw materials that are needed are not produced within these states, the ease of transportation allows them to be brought in without too great expense. Usually it is cheaper to carry raw materials for manufacture to the coal than to carry the coal to the raw materials. After knowing all these facts, you may not be surprised to learn that nearly one half of all the manufacturing in the United States is done in this section. In fact, this is a district where people live in cities rather than in the country; about four fifths of the population is urban. We have already seen that transportation is one of their chief occupations. Manufacturing is another.

Why manufacturing is here a leading occupation

The most extensive manufacturing is that of iron and articles made of iron. The starting point is *iron ore*. Like coal, the iron deposits in the earth were formed long ago, but in a very different manner. Small quantities of iron exist in many minerals and rocks; indeed, the red or yellow color of many soils and rocks is due to it. As water has worked its way through the earth, it has dissolved the iron much as it might have dissolved sugar or salt if either had been there. Where the conditions were favorable, the water carried quantities of the iron to one point and there deposited it. In that way beds or veins of iron ore were formed; it is these that are now being mined. Sometimes the beds are so near the surface that the ore is taken out of great open pits, much as sand is scooped out of a sand pit. There it is soft and loose, like earth, except that it is yellowish or reddish brown and much heavier than earth.

Manufacture of the heavier iron and steel goods

1. What is meant by iron ore, and how it is mined

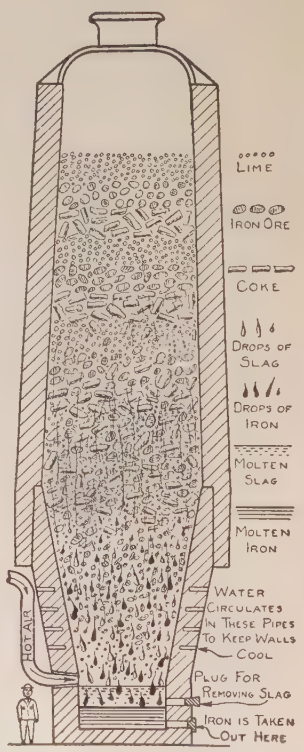


Fig. 31. — Cross section of a blast furnace

Again the veins may lie very deep, where the ore resembles hard, black rock. Then it is mined in much the same way as coal.

The iron ore is not iron, any more than wheat is flour: it is only the stuff out of which iron may be made by a great deal of work. To obtain the iron, two materials, coke and

2. How iron is made from iron ore

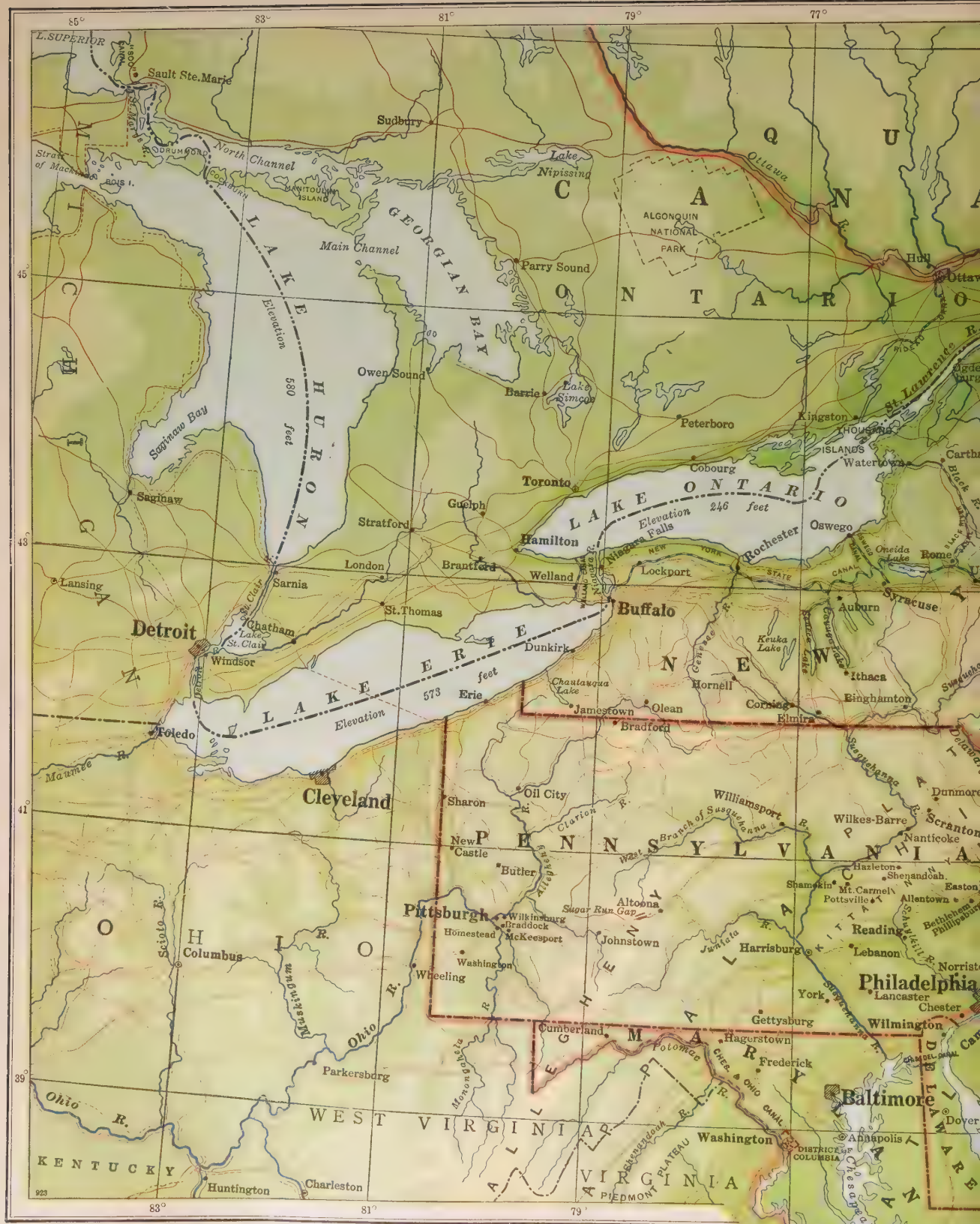

85°
83°
81°
79°
77°
L. SUPERIOR
Sault Ste. Marie
Sudbury
Strait of Mackinac
DRUMMOND I.
BOIS I.
North Channel
GEORGIAN BAY
MANITOULIN ISLAND
Lake Nipissing
Ottawa R.
ALGONQUIN NATIONAL PARK
Parry Sound
Hull
Ottawa
Main Channel
LAKE HURON
Elevation 580 feet
Owen Sound
Barrie
Lake Simcoe
Peterboro
Kingston
THOUSAND ISLANDS
Watertown
Cobourg
Toronto
Saginaw Bay
Saginaw
Guelph
Stratford
LAKE ONTARIO
Elevation 246 feet
Niagara Falls
Hamilton
Rochester
Oswego
Oneida Lake
Rome
Lansing
London
Brantford
Welland
Lockport
Sarnia
St. Clair R.
Detroit R.
Lake St. Clair
Chatham
St. Thomas
Buffalo
Auburn
Syracuse
Detroit
Windsor
Dunkirk
Genesee R.
Keuka Lake
Seneca Lake
Cayuga Lake
Ithaca
Hornell
Chautauqua Lake
Jamestown
Olean
Corning
Elmira
Binghamton
LAKE ERIE
Elevation 573 feet
Erie
Toledo
Bradford
Maumee R.
Cleveland
Oil City
Sharon
Williamsport
Susquehanna R.
Dunmore
Wilkes-Barre
Scranton
Clarion R.
New Castle
Butler
Allegheny R.
West Branch of Susquehanna R.
Nanticoke
Hazleton
Shenandoah
Shamokin
Mt. Carmel
Pottsville
Easton
Allentown
Bethlehem
Phillipsburg
Pittsburgh
Wilkinsburg
Braddock
Homestead
McKeesport
Sugar Run Gap
Altoona
Johnstown
Reading
Schuylkill R.
Juniata R.
Harrisburg
Lebanon
Norristown
Philadelphia
Lancaster
York
Chester
Gettysburg
Wilmington
Columbus
Scioto R.
Muskingum R.
Ohio R.
Wheeling
Washington
Cumberland
Hagerstown
Potomac R.
Frederick
Monongahela R.
Parkersburg
Baltimore
Annapolis
Dover
Ohio R.
WEST VIRGINIA
Washington
DISTRICT OF COLUMBIA
Chesapeake Bay
KENTUCKY
Huntington
Charleston
VIRGINIA
PIEDMONT PLATEAU
Potomac R.
923
83°
81°
79°

Fig. 32

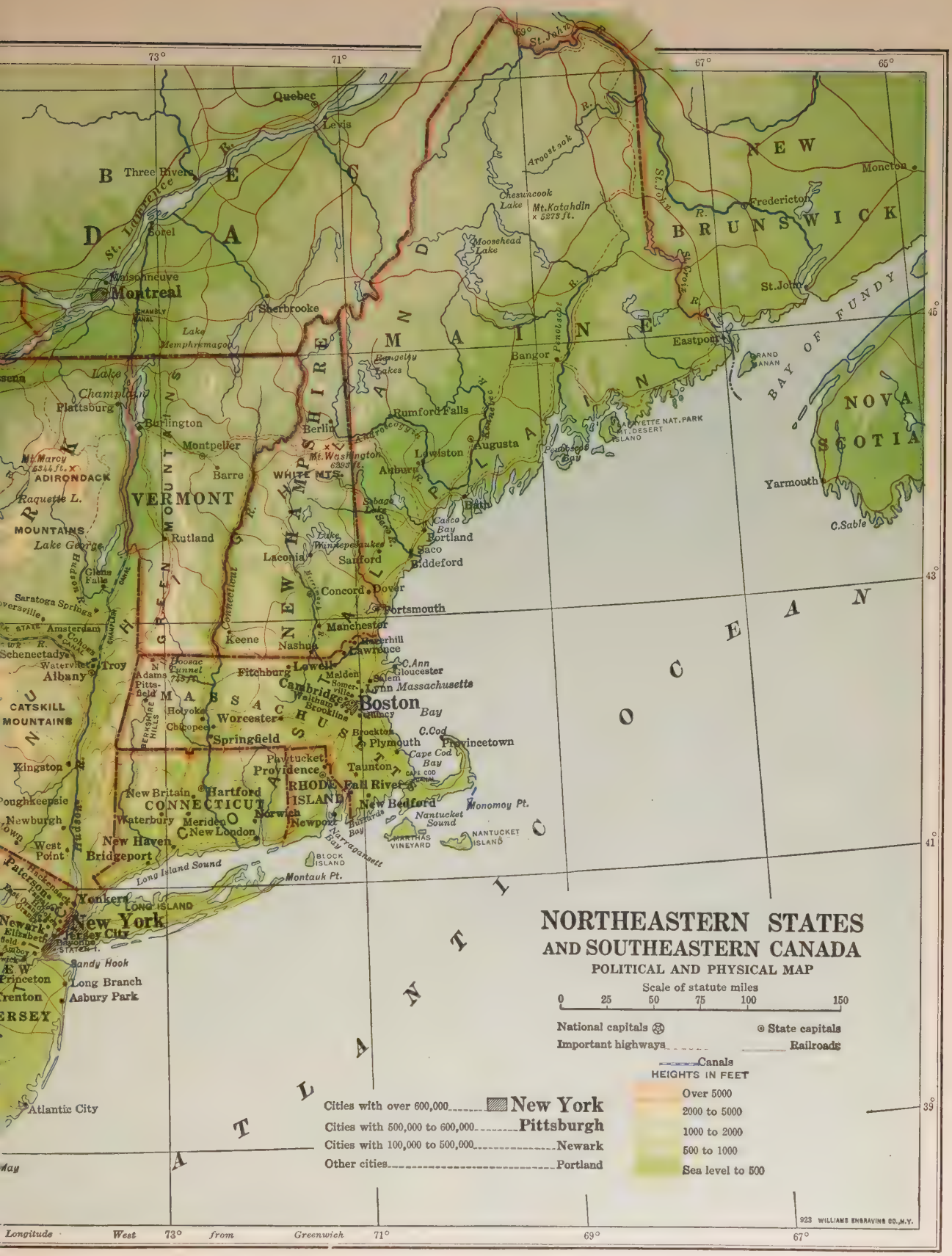
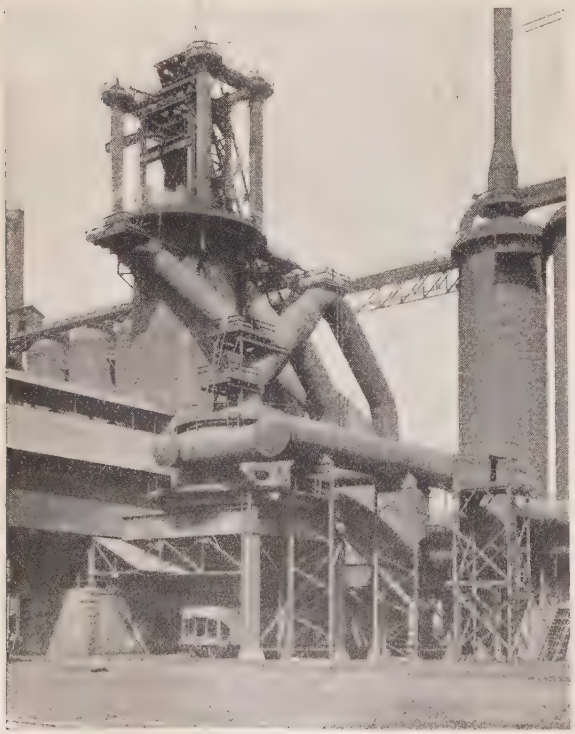

NORTHEASTERN STATES
AND SOUTHEASTERN CANADA
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 25 50 75 100 150
National capitals
State capitals
Important highways
Railroads
Canals
HEIGHTS IN FEET
Over 5000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Cities with over 600,000 New York
Cities with 500,000 to 600,000 Pittsburgh
Cities with 100,000 to 500,000 Newark
Other cities Portland
Longitude West 73° from Greenwich 71° 69° 67°
923 WILLIAMS ENGRAVING CO., N.Y.
ATLANTIC OCEAN
BAY OF FUNDY
NEW BRUNSWICK
NOVA SCOTIA
MAINE
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
Quebec
Montreal
Boston
New York
Portland
Concord
Albany
Hartford
Providence
Worcester
Springfield
Lowell
Manchester
Augusta
Bangor
Moncton
Fredericton
St. John
Yarmouth
C. Sable
Atlantic City

Fig. 32

Questions on Fig. 32. — 1. How many canals can you find on this map? One in Massachusetts and one in New Jersey might easily escape your notice. Show how the coloring of the map explains the possibility of digging canals at these points. 2. If you wish to find smaller places than are shown in this map in the area of densest population, consult Fig. 500. 3. Consult Fig. 19 to find out which of the states shown in this map are in the group which we are now considering. Notice that only a few of the largest cities outside of this group are indicated on this map. 4. In Massachusetts and in the region immediately surrounding New York City, it is impossible to show cities even larger than those which are shown along the northern border of this map. Consult Fig. 21 to find out why.

limestone, are mixed with the iron ore in a blast furnace. Coke is made from soft coal by driving out some of its gases. It produces a very intense heat when burning and is used to melt the iron ore and limestone. Limestone is used to unite with the impurities in the ore, forming a substance called *slag*, which is so much lighter than the molten iron that it rises to the surface.



Courtesy of E. R. Hayhurst

Fig. 33. — Blast furnace

In Fig. 33 you see a tower-like structure called a *blast furnace*, into which the iron ore, coke, and limestone are dumped together from the top. For each ton of ore about a half ton of coke and one fourth of a ton of limestone are used. In some of the larger blast furnaces 1,500 to 2,000 tons in all are required every twenty-four hours.

In the ordinary furnace for heating houses, the natural draft of air produces sufficient heat; but in the blast furnace air under high pressure is blown in through the bottom, as shown in the figure; hence its name. In this way a very great heat is produced. Note where the drops of slag and iron begin to form. This is the hottest part of the furnace, where the enormous temperature of 3,000° Fahrenheit is reached (Fig. 31).

In spite of such a temperature, there is an interval of about fifteen hours from the time a piece of ore is put in at the top before the iron in it is ready to be removed at the bottom. That shows what a task it is to obtain iron from the ore. From 400 to 800 tons of iron may be produced in twenty-four hours by a large furnace. When such a furnace once starts, it does not stop, but goes on day and night every day in the year, including Sundays and holidays. Do you see any reasons for that necessity? The iron is drawn off every four to six hours, as the raw material is "charged" in at the top. When the iron is drawn off, it is molded into blocks a little larger than a large brick, called *pigs*. They get their name from the fact that formerly the molten iron was run into forms in sand with little branches which resembled pigs lying beside their mother. That is the *pig iron* of commerce, which is

© Publishers' Photo Service

Fig. 34. — The storage yard of the Bethlehem Steel Works at Bethlehem, Pennsylvania

In the foreground is pig iron stacked like cordwood. In the background are piles of iron ore that have just been unloaded from the railroad cars by means of the buckets suspended from the huge derrick. The blast furnaces where pig iron is made from iron ore are just to the right of this view.

as important in the field of industry as flour is among foods.

The blast furnace is the very center of modern industry. The thousands of men in the iron mines are working to keep such furnaces going; so are many of the thousands who mine coal, who change coal into coke, and who quarry limestone. On the other hand, the pig iron that the blast furnaces produce is the principal material used in the hundreds of iron and steel industries in these states.

3. The different kinds of iron

Some iron goods, such as stoves and the iron parts of your school desk, are nothing more than this pig iron melted and cast, in molds, into the shape that is desired. This is *cast iron*, which is so brittle that it breaks under a heavy blow. Other materials, such as knife blades, boiler plates, rails for railroads, and watch springs are made of *steel*. This also is made of pig iron, though not until it has been melted again, purified, mixed with other substances, and greatly hardened and strengthened by a complicated process. *Wrought iron*, a third kind, is used where it is necessary for the metal to be tough and at the same time to bend easily, as in iron wire.

4. Why the heavier iron and steel goods are made in and near Pennsylvania

As has been suggested, the most necessary materials, in addition to iron ore, for the manufacture of pig iron are soft coal and limestone. Pennsylvania leads all the states

Fig. 35. — Molten steel running from an open-hearth furnace

By means of huge buckets and cranes, molten iron and steel are carried to various parts of the plant and poured about as easily as water.

© Publishers' Photo Service

Fig. 36. — Making cannon at the Bethlehem Steel Works, Pennsylvania

During the World War many steel plants in this country were devoted to the manufacture of cannon, shells, armor plate, and parts of steel vessels. Much of the finishing of cannon is done by machines that work very accurately with only a small amount of attention on the part of the men who have charge of them.

in the production of these two materials; naturally, therefore, it leads them all in iron and steel manufacture. There are about 400 blast furnaces in the United States, but rarely more than 200 or 300 are in operation at one time. About one third of the total number are in Pennsylvania.

The greatest center for such work is Pittsburgh. Buffalo and other cities on Lake Erie produce a great deal of iron and steel, but they suffer a disadvantage because they are farther from the coal supply. Show that this is true. What advantage have they?

Pennsylvania leads all the states, also, in the production of steel and heavy articles made from steel, such as rails, car wheels, locomotives, armor plate for warships, and heavy machinery. Knowing these facts, you have some idea not only of what the cities of Pennsylvania are manufacturing, but also of the manufactures of the other cities within easy reach of the Pennsylvania coal. Make a list of other heavy articles made of iron or steel that have not been named here, such for example as furnaces, elevators, and radiators for heating. Then name and locate the cities of more than 100,000 population that you find in Pennsylvania, New York, New Jersey, Maryland, and Delaware. Most of them are making some of these articles, and the greatest steel centers are undoubtedly manufacturing all the things in your list.

The manufacture of cement also has become very important in recent years. It is made by crushing to a fine powder a mix-

ture of limestone and clay-like rock and then heating the mixture to a high temperature until the moisture in it has been driven off. After this process it is again crushed to a powder. When this powder is mixed with water and allowed to dry or "set," it becomes as hard as the rock from which it was made, and much more durable.

Other kinds of manufacturing in and near the coal fields

1. The nature and importance of cement manufacture

Cement has two great advantages over stone for building. First, it can easily be molded to any form while it is soft, and thus saves the difficult chiseling necessary in the case of rock; and, secondly, no matter how large the structure, small amounts of cement can be carried at a time, while with rock heavy slabs must frequently be used. Indeed, cement might be called "the rock which can be carried in buckets." Make a list of the purposes for which you have seen it used.

When cement is mixed with sand and small stones, crushed rock, cinders, or blast-furnace slag, it is called *concrete*. The cement holds these materials together, thus making it possible to fill up a large space without using a very large amount of cement. When *reënforced* with a skeleton of wires or rods, concrete can take the place of wood and iron in many kinds of building work. What are some of the advantages of having a building made of concrete? Some engineers are of the opinion that the great pyramids of Egypt are made of concrete, which will give you an idea of its durability.

Although cement has long been known, little of it was made in the United States until about 1885, when the discovery of cheap methods of crushing and heating the materials caused a rapid increase in its production and use. In 1924 over 147,000,000 barrels were shipped from our cement plants.

Unlike the automobile industry (p. 84), the manufacture of cement does not tend to be confined to any single section of the country. There are two explanations for this. The first is the high cost of shipping such heavy material. Cement weighs about twice as much as coal, and it must be shipped in closed cars so that moisture cannot affect it. Consequently, in normal times the freight charges for a few hundred miles will double its cost. The second reason is that the materials for manufacturing cement are found in every state of the Union. As a result, the industry tends to be a local one, each plant supplying the territory for a few

Fig. 37. — A limestone quarry

The steam shovel is filling these cars with limestone, which will be taken to factories to be made into cement.

hundred miles around it. On account of the dense population of the Northeastern States, however, the demand there for cement is especially great, and since all the materials for its manufacture, including fuel, are abundant, more of it is produced in this section than anywhere else in the world.

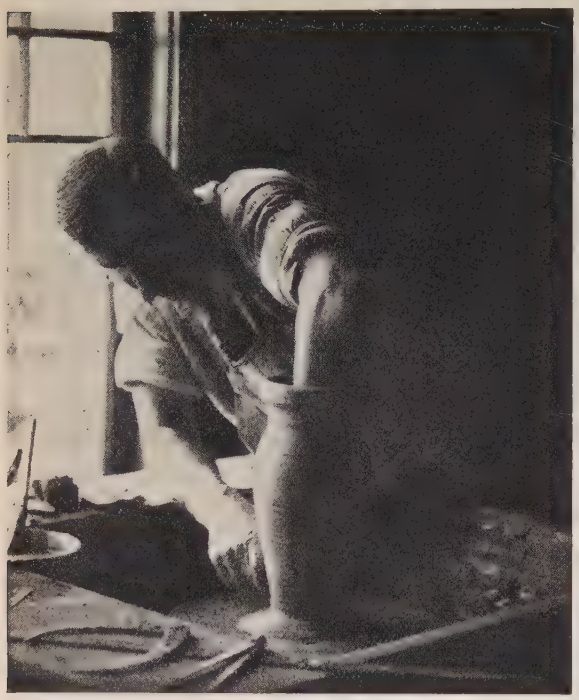


Fig. 38. — A potter making earthenware

Pittsburgh is the greatest center in the United States for the manufacture of glass, particularly plate glass. Near by is found the peculiar kind of sand from which glass is made, when mixed with lime (which is also available here in large quantities) and small amounts of other substances. Not only are all the materials for glass thus easily obtained, but there is a plentiful supply of the fuel required for melting these together.

2. Why Pittsburgh is noted for glass

In the neighborhood of Trenton, New Jersey, is a kind of clay especially suited to the manufacture of pottery. Since fuel is near at hand, the pottery industry there has been extensively developed. Fine vases and chinaware are made, some of the plates for table use selling at retail for as much as $150.00 apiece, or $1,800.00 per dozen.

3. How coal and clay help to locate two other industries

Again, clay suitable for brick is widely distributed, but is especially abundant near Philadelphia and along the Hudson River above New York. The demand for brick is very great in the large cities, especially because danger from fire forbids much use of wood in the construction of buildings. Since fuel is easily obtained at those points, brickmaking has become a very important industry there.

How New England benefits from Pennsylvania coal in metal manufactures. — New England produces practically no coal or iron. It would be at a serious disadvantage, therefore, if it attempted to make the same things that are manufactured in Pennsylvania and its neighboring states; yet, by choosing a different type of metal product, it has become as noted for its metal manufactures as these other states. For example, several thousand Waltham watches are made every day in Waltham, Massachusetts; and many watches and clocks come from Waterbury, Connecticut. The Singer Sewing Machine Works cover many acres in Bridgeport, Connecticut, and Providence is noted for its jewelry. Other metal goods produced in large quantities are tools, firearms, needles, wire, cartridges, cutlery, screws, and locks.

The types of metal articles which it manufactures

There are two reasons for such selection. One is that the articles are very light. New England manufactures some heavy metal goods, such, for example, as heavy machinery that is used in its own factories and for that

The reasons for such selection

reason can better be made on the spot; but most of its products are so light that their manufacture requires a very small amount of coal and of metal. Thus, while dependent on Pennsylvania for fuel, it makes itself as little dependent as possible.

The other reason is that such articles, being distinguished by elegance and finish, require a high degree of skill. A steel rail costs only a few times as much as the pig iron from which it is made; when one buys it, therefore, one to a large extent buys raw material. A watch, on the other hand, may cost a thousand times as much as the few ounces of metal that it contains; and when one buys it, one to a large extent buys skilled labor. The New England industries represent an advanced stage in manufacturing, where quality of labor and skill in workmanship are far more important than the quantity of raw material and of fuel consumed.

New England manufactures one half the total amount of small metal goods produced in the United States. The chief reason why this type of manufacturing is profitable in this district is the large supply of skilled labor. Some of the ways in which it has come to have such a supply will appear later (p. 48).

© Detroit Publishing Co.

Fig. 39. — A portion of one of the cotton mills at Fall River

Fall River is one of the most important cotton-milling cities in the United States, having more than a hundred large mills. Cotton is easily obtained from the ports of the South by boat.

How other manufacturing in New England is carried on at a disadvantage. — New England produces no cotton, little wool, and few hides for leather. In order to manufacture cotton goods, the cotton must be brought from the Southern States or from abroad. Wool for woolen goods must be brought mostly from the West or from Argentina or Australia. Raw hides and leather for leather goods must also come from our Western States or from foreign countries such as Mexico, Canada, and Argentina.

The surprising rank of New England in the manufacture of cotton, woolen, and leather goods

In spite of these facts and the want of coal, there are about 450 cotton mills in New England making such articles as sheets, towels, stockings, underwear, gingham, and calico. There are also many woolen mills making woolen cloth, underwear, blankets, stockings, rugs, carpets, and many other things. There are likewise many tanneries for making leather and many factories for manufacturing such goods as shoes, pocketbooks, harness, and leather bags. One of the largest cotton factories in the world is located at Lowell, Massachusetts, and one of the largest sole leather factories is at Haverhill. New England

Fig. 40. — Cotton laps in a mill at Cohoes, New York

The raw cotton has been cleaned and fluffed. It is then delivered to the carding machine in a large roll, or lap, resembling a huge cotton bat. From this the fibers are fed into a drum, which straightens them and gives the beginnings of a twist, producing the *card sliver*. From this the thread is spun.

manufactures about one half of all the cotton, woolen, and leather goods made in the United States, which is a fact even more surprising than its extensive manufacture of metal goods.

1. Method of cotton and woolen manufacture

The cotton arrives at the mill in bales, each weighing about 500 pounds, and is made into cloth in the following manner. First, the dirt, small sticks, and other foreign matter are removed. Then the cotton fibers, of various lengths, are combed out straight and well mixed with one another. After that they are pressed into thin, gauzelike sheets. These are gradually drawn out and twisted into threads, and then wound upon spindles and taken to the looms for weaving. All this work is done by machinery.

Cotton cloth is nothing more than such threads woven together, those that extend lengthwise of the piece being called the *warp*, and those across it, the *woof*. An ordinary piece of calico has a warp of perhaps 1,200 threads, while a wide piece of cloth, such as a sheet for a bed, may contain as many as 2,500. Stripes and other patterns are made by printing, or by coloring the threads differently and then, before the weaving begins, carefully arranging them according to some design.

Wool, after being sheared from the sheep, is washed and freed from burs and sticks. It is then untangled and combed out straight, after which it is twisted into yarn, much as cotton is twisted into thread. The yarn is woven into cloth in the same manner as the cotton thread.

Leather is made from the hides of animals, such as cattle, sheep, goats, horses, and hogs.

© *Underwood and Underwood*

Fig. 41. — Looms at work in one of the large weaving rooms in New England

There are several rows of looms in this room and several looms in each row. Each loom is operated as a unit, but the looms are so delicately adjusted that they require little attention by the workers. Such factories have a surprisingly small number of workers when the great amount of machinery is considered.

2. How leather is prepared and made into shoes

After the hair is removed, the hides are taken to tanneries, where they are soaked in *tannic acid* to make them soft and durable.

Some of the tanneries are situated near forests, as in Michigan, where there are many hemlock trees whose bark produces the tannic acid. Others are in the mountains of North Carolina, where there are varieties of oak and chestnut from which tannic acid is made.

Some of the tanneries of New England also are near the forest, but many, like those in and about Salem, are not. To these, both the hides and the bark must be brought a long distance. In some tanneries other chemicals are used in place of the tannic acid from hemlock or oak bark. In a single tannery near Boston, where sheepskins are tanned, from 30,000 to 40,000 skins are prepared each week.

Name as many leather products as you can. Much of the output of the tanneries is used in the manufacture of shoes. After being tanned, the leather is brought to the shoe factories and cut up, one operator cutting out soles of a certain size, a second tops, a third tongues, etc.; these parts are then sewed or nailed together, and the shoes are soon finished. As in the case of cotton and woolen manufacturing, nearly all the work is done by machinery, each person caring for one or more machines and performing the same simple task day after day.

How New England can compete with other regions in the textile and leather industries

New England must compete directly with the Southern States in the manufacture of cotton goods, and with various other districts in all three of these industries. For example, cotton goods are extensively manufactured at Utica; shoes at Rochester and Binghamton, and rugs and carpets at both Yonkers and Philadelphia.

© *Underwood and Underwood*

Fig. 42. — Workers cutting out parts for shoes in a factory at Lynn, Massachusetts

Why is the manufacture of shoes so prominent in New England? Where does the leather come from? To what parts of our country are the shoes shipped? Do you wear shoes made in New England?

Yet New England prospers, for several reasons. While it lacks coal, it has, as we have already noted (pp. 10 and 34), a great quantity of water power, which gave it an early start. Note the several cities on the lower Merrimac River, all of which make much use of its power. Yet these cities must provide steam also, since the water supply does not meet the demand at all seasons. Explain why it is that other cities, like New Bedford and Fall River (Fig. 32), are so easily supplied with coal from Pennsylvania that the added cost for fuel is not great.

The large number of skilled workmen is,

however, a more important advantage. Because of the long winters and the meager opportunities in agriculture, some of the New England states got an earlier start at manufacturing than the other sections of our country. At first each family made within its own home most of the things it needed, spinning and weaving wool, making clothes, shoes, and harness, and whatever else plain people in a new country required. Later, when the opportunity came to manufacture large quantities of goods in factories, skilled workmen were at hand in large numbers. As in the case of the metal goods, they have chosen to manufacture high-grade articles that call for a special degree of skill.

In the early days of our republic, moreover, many state and national laws were passed that favored factories. After these factories have for some generations sent forth goods of excellent quality, their reputation greatly helps them. In fact, that is now possibly the greatest advantage enjoyed by this section. Whether New England manufacturers will be able to maintain their leadership in the future is a question, for in recent years the Southern States have been taking over more and more of the cotton manufacture, which is the most important of these three industries in New England (see p. 45); small metal goods are being made in increasing quantities in New York, and in Ohio, Illinois, and other states of the Middle West; and the rise of manufacturing on the Pacific coast, particularly in California, is beginning to close the Western markets to certain Eastern products.

The nature of a manufacturing town. — The eleven states of the Northeastern group, as we have seen (p. 37), do nearly one half of all the manufacturing in the United States. In consequence, the cities here are very different in appearance from those in many other sections, for they are chiefly manufacturing centers. For example, New Bedford, with a population of 121,000, has nearly seventy cotton mills, which employ more than 35,000 persons. It also makes silverware, cut glass, rope, leather machinery, paint, lumber, and oil. Probably more than one third of all its inhabitants are at work every day in factories. Haverhill, with a population of 54,000, employs more than 15,000 in the manufacture of shoes; it has woolen mills in addition, and makes a large quantity of

© Publishers' Photo Service

Fig. 43. — Bethlehem Steel Works

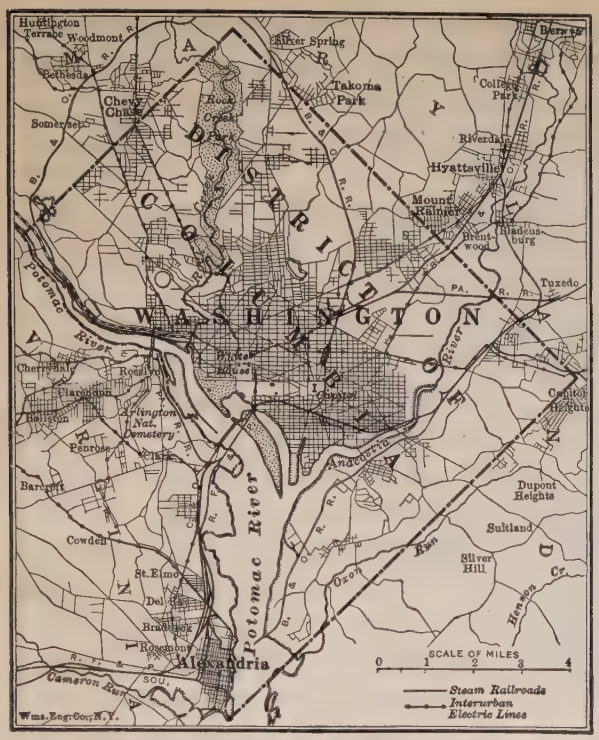


Fig. 44. — The District of Columbia

wooden and paper boxes, brick, cement, and leather. Fig. 43 is a picture of the Bethlehem Steel Works in Pennsylvania. Bethlehem is a city of only about 50,000 population, yet these works employ as many as 10,000 persons. One finds many factories in almost any city in these states; sees the streets thronged with workmen at certain hours in the morning and evening; and discovers that some of the leading topics of interest are raw materials and their manufacture and sale.

How Washington, D. C., differs from such manufacturing centers. — Washington, D. C., however, is a striking exception to this rule. It is unlike the other cities in two respects. Since it was certain that it would one day be very large, it was carefully planned, with wide streets and many parks. For that reason, it is more attractive than a city having a large number of factories. Also, the people are not especially interested in manufacturing and commerce. Here reside the President, members of Congress, the judges of our Supreme Court, and the representatives of the other great nations of the world.

Photo by Manufacturers' Aircraft Assn

Fig. 45. — An airplane view of a part of Washington, D. C.

What building or buildings in this picture do you recognize?

Thousands of men and women are at work in the various departments of the government, and there are always many visitors. The principal buildings, therefore, are not factories and private offices, but government offices, apartments, and hotels, and the chief interest is in matters of government. It is because of this different interest that Washington is controlled directly by the national government. The population in 1920 was 438,000. The District of Columbia, in which Washington is located, gives the city plenty of room to expand without encroaching on the neighboring states. During the World War more than 100,000 employees of the government resided there; but now that number is considerably reduced.

Fig. 46. — Philadelphia and its suburbs

The great cities. — The four largest cities in the Northeastern States are New York, Philadelphia, Boston, and Baltimore. Locate each. Why should Philadelphia and Baltimore be regarded as coast cities, since they are located so far inland?

Why the cities on the coast are the largest

1. Their superior advantages for transportation

Just as these Northeastern States owe much of their importance to the fact that they lie directly between the interior of the United States and Europe, so the cities just named owe their present importance largely to the fact that they are the principal gateways between these two continents. Most of our imports enter by these ports and most of our exports leave by them. When an ocean liner docks in any of these cities, its hundreds or thousands of passengers must be transported over the city in all directions, and its thousands of tons of freight keep scores of longshoremen and truckmen busy for several days unloading it and carting it away to stores, trains, and other boats. Thus the arrival of a single ship gives work in transportation to hundreds of persons. Many ships arrive and many leave every day, and scores of trains enter and leave the city every hour. Thus transportation is one of the occupations that has attracted so great a population to these centers.

2. Their advantages for manufacturing

Because people and freight can reach and leave these points so easily, they are excellent locations for factories. Neither fuel nor raw material for manufacture is produced in large quantities very near any one of them; but they can all obtain such things so readily, and can ship manufactured articles away so cheaply, that they are admirably situated

for manufacturing; this, in fact, is the second great industry that has brought together so many people in each center.

How Buffalo and Pittsburgh serve as gateways to the Middle West

The city directly west of Boston that most nearly approaches it in size is Buffalo. Compare their populations (p. 481). Name and locate the leading cities between the two; between Boston and New York. West from Philadelphia and Baltimore the leading city is Pittsburgh. Compare it with Baltimore in population. Both Buffalo and Pittsburgh are, like the coast cities, gateways between the East and the Middle West. Show some of the advantages they enjoy both for transportation and for secur-

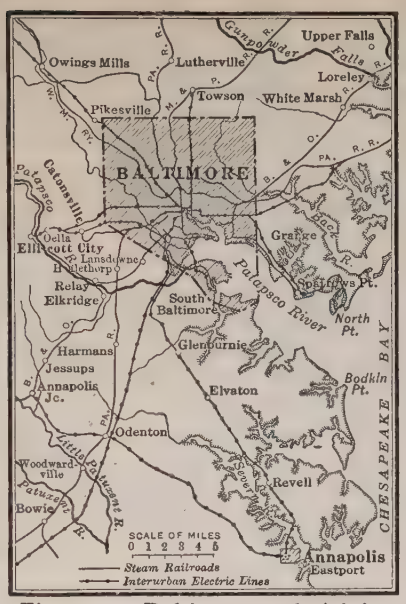


Fig. 47. — Baltimore and vicinity

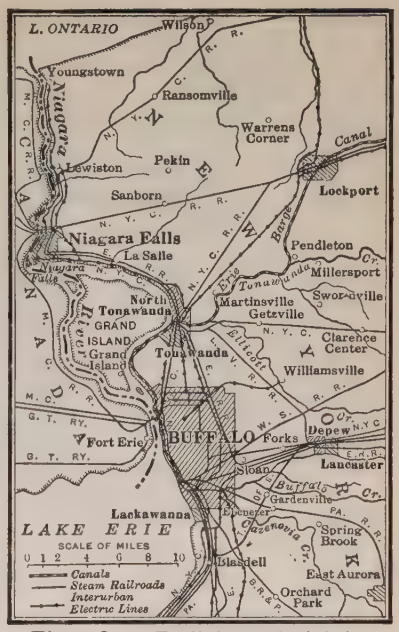


Fig. 48. — Buffalo and vicinity

Fig. 49. — Boston and vicinity

Fig. 50. — Pittsburgh and vicinity

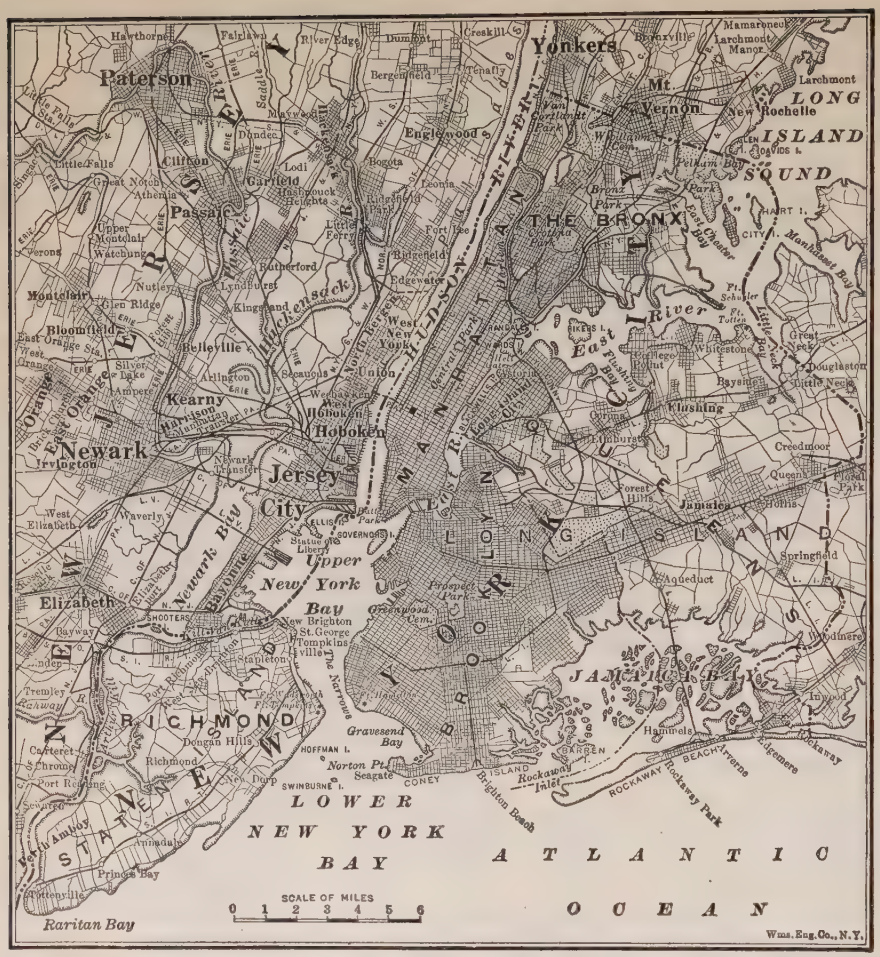


Fig. 51. — Greater New York and its many suburbs

Locate the five boroughs of New York City. Note the large number of cities north and west of New York. How would you expect the shape of Manhattan Island, the business center of New York, to affect the ease with which people pass to and from their daily work?

ing raw materials for manufacture. Thus Buffalo has become the second city in the world in the manufacture of flour (see pp. 76–78). For what industries is Pittsburgh noted (pp. 42 and 44)? The fact that the coast cities are larger, however, indicates that their communication with all parts of the world by water is a matter of great importance. It is their location more than any other fact that has caused their growth.

New York City is nearly twice as large as Philadelphia, Boston, and Baltimore together.

Ways in which New York surpasses the other coast cities

1. Its size compared with theirs

Each of these four has other important cities near by. Name those in the neighborhood of New York, and note their population. Which is the largest? Name also those near Philadelphia; near Baltimore; near Boston. If to each of these four cities we add the population immediately surrounding it, New York would still contain nearly twice as many people as all the others together, *i.e.*, nearly 8,000,000. It is the greatest mass of people in so small an area in the world.

To a similar degree, New York leads in amount of business. Over two fifths of the total imports and exports of the United States go through its harbor, New Orleans and Galveston competing with each other for second place. Not only has New York water and rail connection with Buffalo, but the principal railroads that run west and southwest from Philadelphia and Baltimore have terminals at New York. Trace these various routes in Fig. 233.

2. Its leadership in important lines of business

Its lead in manufacturing is shown in the fact that the value of its manufactures is about one tenth that of all the goods made in the United States. While it makes metal goods very extensively, its leading manufacturing industry is the making of clothing. Nearly one half of all our ready-made clothing comes from this city.

3. The impression it makes as a great city

New York's business center is the most imposing group of buildings in the world. It occupies the southern half of Manhattan Island, covering an area about six miles in length and averaging hardly more than two miles in width (Fig. 51). Many of the chief business houses of the country have their headquarters in this section; and since the available floor space for offices and warehouses cannot be increased except by building many-storied structures, here is the greatest collection of tall buildings in the world, some of them containing offices for 10,000 to 12,000 persons. On account of the number and height of the buildings, many of the streets resemble deep canyons and are so narrow that they are greatly congested.

Several square miles of this area are given up to the wholesale trade. Goods manufactured in the city, together with those brought from all parts of the earth, are collected in this section; and merchants from distant cities purchase from among them the wares for their own stores. Here, alse, are some of our greatest banks. New York is now the leading money center of the world. The center of the banking business is a short street called Wall Street.

© U. S. Air Service

Fig. 52. — The southern end of Manhattan Island

In no other city in the world are there as many high buildings as in New York. In the foreground, at the left, is the approach to the Brooklyn Bridge. At the extreme right are the Woolworth Building and the City Hall. — This photograph was taken from an airplane; the camera was pointed toward the southwest.

© Publishers' Photo Service

Fig. 53. — Grand Central Station, New York City

Only the front of this immense railway station is shown here. There are large waiting rooms, restaurants, and stores beneath the street level. In the background is one of the largest hotels in the world.

How food is obtained for so many people. — To furnish food for such a dense population a vast extent of good farm land is needed; and there is far from enough of it in the Northeastern States. Mountains and ridges make agriculture impossible over large areas. Locate the White Mountains; the Green Mountains; the Adirondacks; the Catskills; the Alleghenies. About how much of Pennsylvania and New York is mountainous? How much of New England? The Great Ice Sheet, moreover, left many of the more level areas in a bad condition for farming. Not only did it scrape away the soil from many places and leave the surface very rough, but even where the soil is thick it left many areas strewn with bowlders.

Advantages and disadvantages of these states for farming

1. Drawbacks common to this entire section

Farming in New England suffers from other disadvantages. These states lie so far north that they naturally have a severe climate. Fig. 12 shows that most of New England lies in the belt of *mild summers and extreme winters*. For these reasons farming in New England has not flourished except in small districts where great care has been used to increase the fertility of the soil. In some sections, where the soil is thin and markets are distant, farms have been abandoned; the houses and barns are tumbling down and the orchards are grown up in weeds. Owing to the special demand for food in recent years, some of these farms are again coming under cultivation; but they can never prove very productive. Only about one third of the surface of New England is improved land; this is in striking contrast with Illinois and Iowa, where more than four fifths is improved.

2. Special handicaps of New England

The other states are not so handicapped. The Ice Sheet did less damage to them,

Fig. 54. — A group of farm buildings in the southwestern part of Maine

Many other farms in this region have buildings very similar to these.

partly because it covered only a portion of their surface. Trace its southern boundary in Fig. 55. Their more southern position also gives them a warmer temperature. How large an area in this group of states lies in the belt of *hot summers and cold winters?* In these states about twice as much of the land is improved as in New England.

The superior advantages of the other states in the Northeastern group

In the early days New York and Pennsylvania were noted for the production of wheat, and Rochester was a great flour-milling center. Large crops of wheat and oats are still raised; but the Northeastern States cannot raise cereals to the same extent as those farther west, where the land is level, the soil deep, and the farms large; and, on account of the cooler summer climate, corn does not mature so readily.

Why truck-gardening and dairying flourish

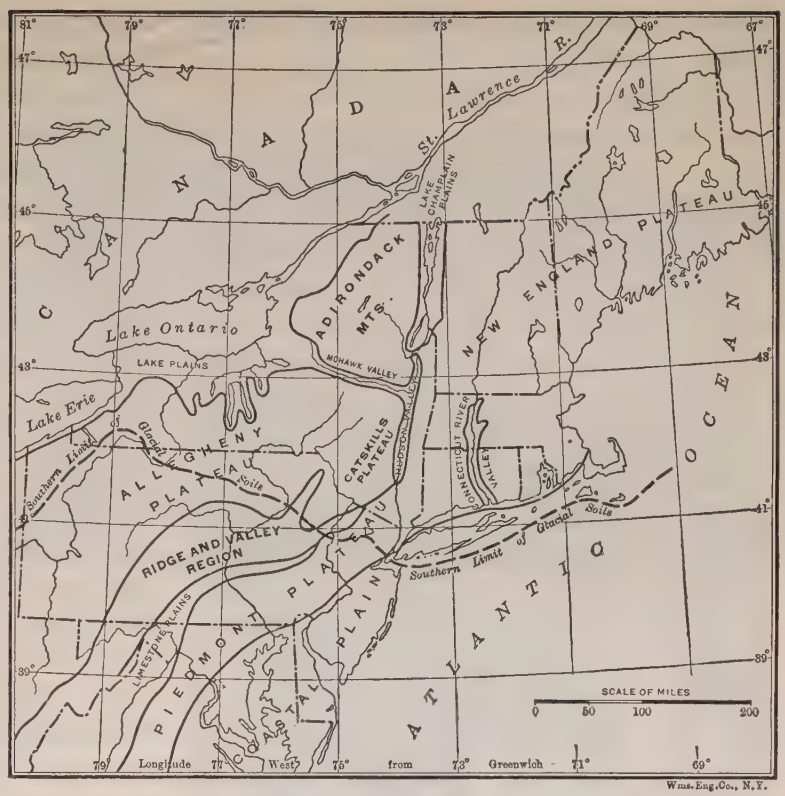


Fig. 55. — Land regions of the Northeastern States

Most of the highland regions have thin soils. The best agricultural lands are found in portions of the Piedmont Plateau, the limestone plains, the lake plains, and the valleys. Name the chief river valleys. The soil of the Coastal Plain is sandy, but excellent for truck gardening.

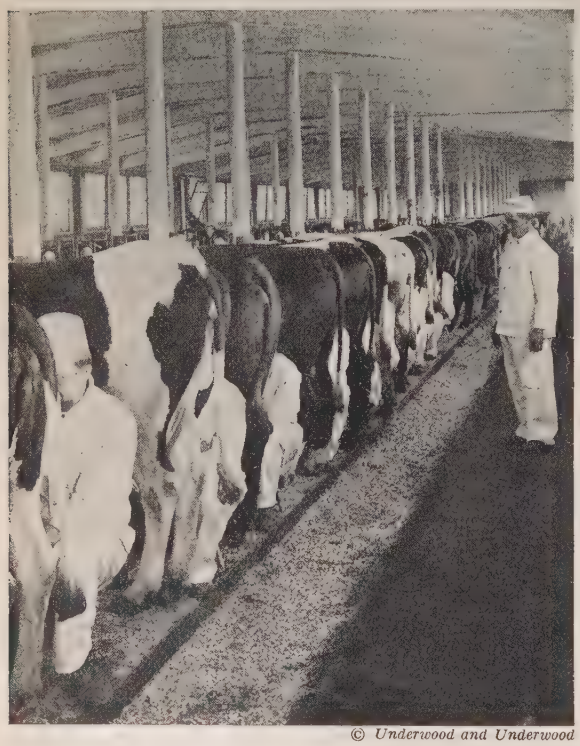
Yet the numerous large cities are the best of markets for all the vegetables and small fruits that the gardener can grow. Truck gardening is, therefore, very important in the neighborhood of all the cities. Sweet corn, too, is one of the leading products, since it does not have to be left to ripen, but is marketed green.

The great demand for milk, together with the fact that much of the land can be used for little else than grazing, makes dairying another important industry. Milk is hauled to New York every day from places 200 and even 300 miles distant; some notion of the magnitude of the work is given by the fact that the union of men in the metropolitan district employed in connection with the delivery of milk consists of 12,000 members. This district includes New York City and the other cities near by in New York and New Jersey. What a number of farmers, farms, cows, trains, and milk wagons in New York State, New Jersey, Pennsylvania, and even New England are kept busy supplying milk to this one center! Yet the area immediately surrounding New York City represents only about one fourth of the population, and therefore of the

demand for milk, in the Northeastern states.

Since there are several sections where fruit trees flourish, fruit raising is extensive. New York and Pennsylvania are noted for apples. One of the most productive regions is that just south of Lakes Ontario and Erie, where the cool winds off the lakes in the spring retard the budding of the trees so that few are harmed by late frosts. Frosts are also less frequent in the spring near large bodies of water. Apples, peaches, plums, and grapes are raised in this region in large quantities. Southern New Jersey, Delaware, and Maryland are also noted for their fruits. Here the winds from the ocean and the bays exert the same influence as do those from the lakes.

Conditions that favor extensive fruit raising



© *Underwood and Underwood*

Fig. 56. — Milking time in a New Jersey dairy

Most of the milking in the dairies of our country is still done by hand. Milking machines are used only to a slight extent. What sanitary measures do you think are being observed here to insure pure milk? What is probably the chief market for the milk of this dairy?

The truck farming, dairying, and fruit raising lead to considerable manufacturing. Many farmers are engaged almost entirely in raising vegetables and fruit for canning; and probably as much corn, and as many tomatoes, peaches, and berries are preserved in cans as are eaten fresh. The fruits are useful in other ways also: the juice of the grapes is bottled fresh, and that of apples is made into cider and vinegar. While most of the milk produced within easy reach of the cities is sent to them fresh, a large part of that produced at a great distance from the cities is made into condensed milk, butter, or cheese. Can you see the reason for this?

Influence of the farming on manufacture of foods

There is one product that seems insignificant, which all of us, nevertheless, must have: and that is salt. Its importance is suggested by the fact that in some countries it has been used as money. Its most familiar use at present is as a seasoner of food; but it is also a necessary food for animals, and is valuable in preserving meat and fish, in making soda, and in several other ways. Our country produces about 7,000,000 tons of it each year, most of which is consumed by us.

Other sources of food

1. Salt

a. Uses of salt

New York is our second state in production of salt, ranking next to Michigan in amount. The salt produced in New York comes from salt beds that lie deep within the earth west and south of Syracuse. They were deposited in a sea that covered this region before the coal period, and were later buried beneath layers of rock, much as the coal beds were buried.

b. Where and how it is obtained

It can be obtained in either of two ways. In one case a small hole is bored to the bed and water is allowed to run down and dissolve the salt. Then the brine is pumped up, and the water is evaporated by heat until only salt is left. In the other case, a shaft, large enough for men to pass up and down, is sunk down to the salt; then lumps of it, called *rock salt*, are broken off the beds and hoisted to the surface. Thus it is mined much as coal is; but a salt mine presents a striking contrast to a coal mine, since its walls and floors are clear, crystal white.

© Detroit Publishing Co.

Fig. 57. — Drying cod at Gloucester, Massachusetts

Gloucester is one of the most important fishing ports in the world. About 6,000 of its inhabitants are engaged in this occupation.

While the farm products of these states are meager, sea food is very abundant along this coast. Formerly great numbers of mackerel, halibut, and cod were caught close to shore, a fact suggested by the name Cape Cod. Although they are now found farther out, hundreds of vessels and thousands of men are engaged in catching them. Many go as far as the Banks of Newfoundland (p. 188), where fish have always been abundant.

2. Fishing

a. Extent and variety of fish

Shad are caught in the bays and rivers. They go up the streams each spring to lay their eggs, or *spawn*, in fresh water; and the young remain there until they are large enough to venture out to sea. It is while on their way to or from the spawning grounds that most shad are caught. Other common kinds of sea food are bass, herring, lobsters, clams, and oysters. The oyster crop in the United States is far greater than that of all the rest of the world, about 37,000,000 bushels being produced by us each year; and the industry is increasing in importance. Chesapeake Bay, because of its great area of water that is less salty than the open ocean, is the most important center for oysters in the world.

© Detroit Publishing Co.

Fig. 58. — An oyster lugger at Baltimore

This small sailing boat is used to harvest oysters in Chesapeake Bay. Chesapeake Bay is the greatest oyster-farming region in the world.

Most of the mackerel are caught in spring and summer. They swim together on the

surface of the ocean in such numbers, or *schools*, that they may easily be seen from a distance. The fishermen who cruise about in search of mackerel sail in swift power-boats, propelled by gasoline, and in two-masted sailing vessels, called *schooners*. When they see a "school" they spring into their boats, row over to the fish, drop a large net, or *seine*, into the water, and draw it around the "school." Then the seine is drawn in, forming a pocket and trapping the fish. In this pocket enough fish are sometimes caught to fill many barrels.

b. Methods of catching the fish

Halibut and cod cannot be caught with a seine, for, instead of swimming at the surface, they live on the sea bottom. Halibut are very large, some weighing more than a man, and they are often caught upon single lines. Codfish may be caught in the same manner, though a *trawl* is more commonly used for cod than for halibut; this consists of a number of hooks hanging from a single long line, all lowered into the water together and left there for hours. The fish swallow the bait on the various hooks, and in this way many are caught at one time.

Such fishing is dangerous, because the men must venture out in small, flat-bottomed boats, called *dories*, to take the fish off the trawls. While they are doing this, a storm may arise or a heavy fog come up and prevent their return to the vessel. They are then left in open boats far out upon the ocean. Every year fishermen from Gloucester, the most noted fishing town in Massachusetts, are lost in this manner.

Dependence of these states on other regions

The people in these states would soon suffer from hunger if they had to depend on themselves for food. Only about one fifth of the population are farmers; and many of the principal foods, such, for example, as wheat, oats, corn, and meat, must be obtained mainly from other regions. Few of the more important agricultural products are grown in sufficient quantities to satisfy the local demand; even vegetables are shipped in large amounts from the South.

The inhabitants are fully as dependent upon outsiders in regard to their manufactures. Most of their raw materials must be brought from distant places, and a good share of their finished goods must be sold elsewhere. Thus this part of our country is greatly dependent on the other sections and on foreign countries.

The development of the railroads. — Such enormous quantities of raw material for manufacture and of food must be transported that the railroads and water routes have an exceedingly important work to do. Most of it falls upon the railroads, for in comparison with them the inland waterways, with one exception (see p. 30), are not important. If the railroads were to stop operation for only a few days, food in these states would become scarce and the factories would close.

The dependence of industry upon them

There are many important railroads here, which are often spoken of as *systems*, the word system meaning a group of roads under one management. Examples are the New York Central system, the Baltimore and Ohio system, and the Pennsylvania system.

The meaning of a railroad system

What is meant by that term is suggested in Fig. 59. All the roads shown there, between New York City in the East and Chicago and St. Louis in the Middle West, are under the control of one company and make up the Pennsylvania system. Its main lines are shown in heavy ink, and its branch lines are lighter. Notice how many branch lines there are, and the states in which they

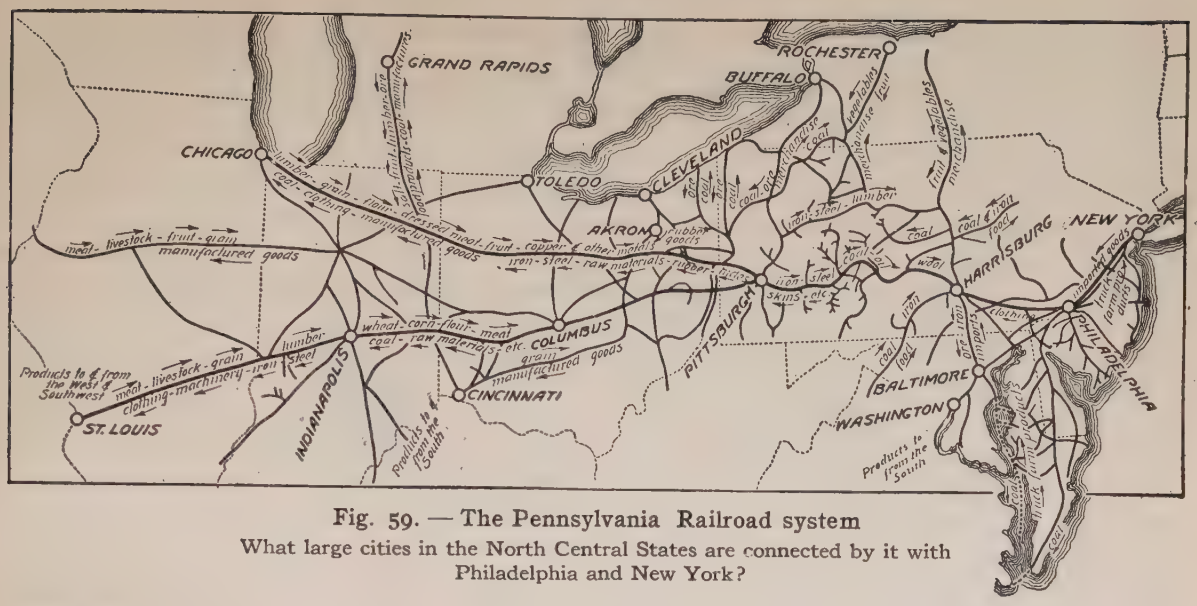


Fig. 59. — The Pennsylvania Railroad system

What large cities in the North Central States are connected by it with Philadelphia and New York?

are principally located. What points do they connect, and what do they carry? What goods are carried each way on the main lines? What reasons can you give for the selection of such goods?

More than one tenth of the railroad traffic of the United States is carried on this system. Altogether it has 27,515 miles of track, 7,647 locomotives, 8,190 passenger cars, and 266,000 freight cars. Of the last, 168,000 are coal cars. More than one half of all the freight carried by the Pennsylvania system is the product of the mines. About one sixth of the freight consists of manufactured goods. Which of the two would you expect to have the greater value?

This system employs about 250,000 men; and since one employee is the head of a family of not less than four persons, on the average, you can get some idea of the number of persons directly dependent upon this road for support. In addition, many others are indirectly dependent upon it, such as, for example, those engaged in manufacturing the cars, rails, and locomotives; the miners who supply it with coal; and the storekeepers who sell goods to its employees.

© Detroit Publishing Co.

Fig. 60. — Crawford Notch in the White Mountains, New Hampshire

The beauty of the White Mountains — the wild gorges, numerous waterfalls, dense forests, and swift streams — makes the region a summer resort much visited by people from the near-by cities.

Although this system is very extensive, how small a portion it makes of all the roads in our Northeastern States can be seen by comparing Fig. 59 with Fig. 233.

Relief from city life. — A large portion of the city people are confined in factories, stores, and office buildings throughout each day. Most of their homes are not separate houses, but apartments or flats, which generally admit fresh air and light from only one or two sides, and which very often have no front or back yard. Thousands of children in New York have never seen a yard or garden; the streets and all open spaces about them, except the parks, are paved. In all the large cities the sidewalks and streets are the principal playground for many of the children, in spite of their crowded traffic and the danger from automobiles.

Why city people need vacations

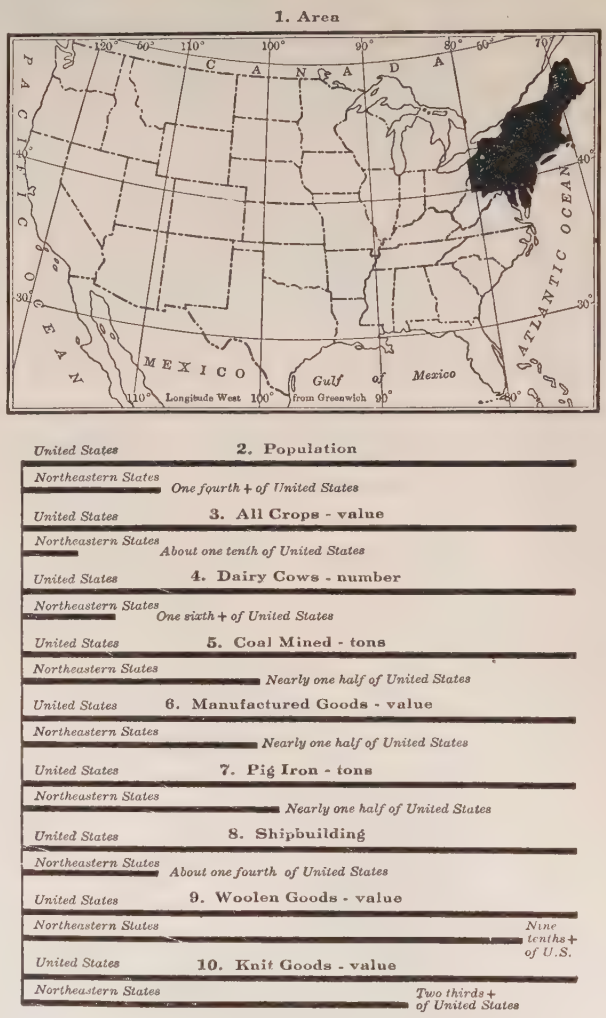

1. Area
PACIFIC OCEAN
CANADA
MEXICO
Gulf of Mexico
ATLANTIC OCEAN
120° 110° 100° 90° 80° 70°
30°
Longitude West from Greenwich
2. Population
United States
Northeastern States
One fourth + of United States
3. All Crops - value
About one tenth of United States
4. Dairy Cows - number
One sixth + of United States
5. Coal Mined - tons
Nearly one half of United States
6. Manufactured Goods - value
Nearly one half of United States
7. Pig Iron - tons
Nearly one half of United States
8. Shipbuilding
About one fourth of United States
9. Woolen Goods - value
Nine tenths + of U.S.
10. Knit Goods - value
Two thirds + of United States

Fig. 61. — The Northeastern States in comparison with the entire United States (1920)

To those who live in the large cities, the country, with its green valleys, its wooded mountains, its rivers, its cool seacoast, and its birds and flowers, is the most inviting place in the world; and hundreds of thousands of the more fortunate city dwellers hasten to it as soon as their vacation time arrives. One of the most popular resorts is the White Mountains in New Hampshire. The Adirondacks and the Catskills are also crowded with visitors in summer. Locate these mountains. Mountain climbing, canoeing, and fishing are some of the more common sports. Many settle down at farmhouses to take walks and enjoy the scenery and the quiet of the country. Great numbers go to the seashore, to escape the heat and to enjoy boating and bathing. The entire coast from Maine to Maryland is dotted with summer cottages and hotels. The most popular of all these resorts is Atlantic City on the New Jersey coast. Its permanent population is only about 50,000, but it is said to have 1,200 hotels and boarding houses and to entertain from 300,000 to 400,000 visitors each summer. At the height of the season as many as 90,000 persons go bathing there in the surf each day.

How they spend their vacations

Facts to be especially well fixed. — 1. Location of the twelve largest cities. 2. Of the six principal rivers. 3. Of the principal mountains. 4. List

of principal farm products. 5. Of principal minerals and manufactures. 6. How New England differs from the other states in manufactures and why.

Problems for independent study. — 1. Make a drawing of New England, showing state boundaries and principal mountains, rivers, and cities. 2. Make a similar drawing of the remaining states in this group. 3. Here is a question for debate: *Resolved*, that it is advisable to use all the water of Niagara needed for manufacturing, even though it destroy the beauty of the Falls. Carpenter, F. G.: *North America* (Edition 1922), pp. 278–282 (American Book); Outlook, vol. 81, p. 696; vol. 83, p. 106 and especially p. 133; Chamberlain, J. F. and A. H.: *North America*, rev., Chap. IX (Macmillan). Write Niagara Falls Power Co., Niagara Falls, N. Y., for pamphlet. 4. Make a model lock, to show how boats are raised and lowered in canals. 5. Write a composition telling the story of a lump of coal. Allen, N. B.: *Geographical and Industrial Studies: United States*, Chapter XI (Ginn); Carpenter, F. G.: *North America* (1922), pp. 283–302; National Geographic Magazine, vol. 34, pp. 407–434; Tappan, E. M.: *Diggers in the Earth* (Houghton Mifflin); McMurry, C. A.: *Type Studies from the Geography of the United States*, pp. 63–80 (Macmillan). 6. Much coal from Pennsylvania goes to Canada. What routes does it take? 7. Study the uses made of concrete in your home community, especially in the case of (1) buildings; (2) sidewalks; (3) roads; (4) ships. 8. Make a list of the articles in your schoolroom made of cast iron, wrought iron, and steel. 9. Why was the original Erie Canal built to Lake Erie rather than to Lake Ontario? Does the New York State Canal connect with Lake Ontario? 10. How is maple sugar made? Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 77–79; Carpenter, F. G.: *North America* (1922), pp. 113–114; Chamberlain, J. F.: *How We Are Fed* (1923), pp. 88–91 (Macmillan). 11. How do the many lakes of New England help to insure a constant flow of water in the rivers? Tarr, R. S., and von Engeln, O. D.: *New Physical Geography*, revised edition, pp. 310–316 (Macmillan). 12. Why should not Baltimore have been located at the mouth of the Susquehanna River? 13. Debate this question: *Resolved*, that the country makes a better home for boys and girls than the city. 14. Locate West Point and Annapolis, and explain their importance. 15. Locate the following universities: Harvard; Yale; Columbia; Princeton; Pennsylvania; Johns Hopkins; Cornell. 16. Here is another question for debate: *Resolved*, that the United States should aid Canada in developing a ship canal from Lake Huron by way of the St. Lawrence River to the Atlantic Ocean. Some of the matters to be considered would be the following: what has already been accomplished in this direction; the distance that would be saved from the North Central States to Europe; present difficulties of shipment from those states to Europe; improvements that would be necessary and their cost; benefit or injury to New York State; the water power that could be obtained from the St. Lawrence River; fitness of lake vessels for crossing the ocean; slow rate of movement of vessels through canals; the length of the season of navigation. Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, pp. 135–136 (Wiley); Smith, J. R.: *Industrial and Commercial Geography*, pp. 693–708 (Henry Holt). 17. In any of the standard magazines, study the advertisements of small metal goods, and make a list of the articles advertised. Note the cities in which these articles are manufactured, and locate them on the reference map (Fig. 499 or Fig. 500). From a study of these advertisements, list some of the articles manufactured in New England; in New York; in Pennsylvania. 18. Why has New York grown to be the largest city in the world? Whitbeck, R. H.: *High School Geography*, pp. 344–345, 406–410 (Macmillan); Carpenter, F. G.: *North America* (1922), pp. 72–95; Hotchkiss, C. W.: *Representative Cities of the United States* (Houghton Mifflin); McMurry, C. A.: *Larger Types of American Geography*, pp. 195 ff. (Macmillan). 19. Show how a strike, or any other condition causing a stoppage or shortage of coal, would affect our lives. Consider what industries would be affected; the people who would be thrown out of work; and the discomforts in your home. 20. Make a collection of wool, showing as many of the stages from the raw wool to the finished cloth as possible. 21. Learn to tell the difference between "virgin wool" and "shoddy."

How to find the books you need in a public library. — In addition to your own classroom

library, you will often find it helpful to use the public library. Every library has one or more librarians who help its users to find what they want. They know exactly where everything is and how to get it quickly. The librarian is always willing and ready to assist you.

The help the librarian can give you

However, if you go to the library often, you ought not to trouble the librarian every time. There are other means by which you may find what you want.

How the card catalogue can help you

When you have asked the librarian whether or not she has a certain book, you have probably noticed that she goes to a large case with many drawers, on the outside of which are the letters of the alphabet. In these drawers are many cards. This is the *card catalogue*, or a series of cards arranged alphabetically like your dictionary, which contains the names of all the books in that library. On each card is the name of a book, its author and publisher, sometimes a very brief description of its contents, and the library number.

Let us suppose that you are hunting for information on the production of wheat in the United States. The most natural place for you to look will be under the name of the industry, *Agriculture*. Go to the drawer marked *A* and look for that subject. Its various branches will be found under such headings as: *Corn*, *Oats*, *Rye*, *Wheat*, etc. Under the classification of *Wheat* a number of books are named, but they may not be what you need. Finally you come to this card:

J 917.2 Bengtson, N. A., and Griffith, D.: The Wheat Industry.

A treatment of the processes of wheat production in Argentina, Canada, the United States, and other great countries, by N. A. Bengtson and D. Griffith. New York, The Macmillan Company (1915).

Tell the librarian the number 917.2. The letter "J" before the number indicates that it is in the juvenile or children's department. She will get the book for you very quickly, for she knows the shelf on which the books of that number are kept. You will then turn to the index and find the pages given under "Wheat in the United States" and select your facts.

Let us again suppose that you desire information on this problem: How do the cities situated on the Great Lakes get pure water? There are several possible headings under which you might look; for instance, *Great Lakes*, *Lakes*, *Water*, *Water Supply*, etc. You find nothing helpful until you open the drawer marked "W," looking for "Water Supply," and find this card:

628 Water Supply
H 331 Hazen, Allen 1869

Clean water and how to get it, by Allen Hazen. 1st ed. New York, J. Wiley & Sons (etc., 1907).

Consulting the table of contents or the index, you find a chapter heading, "Supplies from the Great Lakes . . . . 29," which is just what you want.

You will need some practice before you can use the card catalogue easily; but the librarian will gladly give you assistance when you need it.

2. The North Central States

State	Area in Square Miles	Population (1920)	Largest City	Population (1920)
Illinois	56,700	6,485,000	Chicago	2,702,000
Indiana	36,400	2,930,000	Indianapolis	314,000
Iowa	56,100	2,404,000	Des Moines	126,000
Kansas	82,200	1,769,000	Kansas City	101,000
Michigan	58,000	3,668,000	Detroit	994,000
Minnesota	84,700	2,387,000	Minneapolis	381,000
Missouri	69,400	3,404,000	St. Louis	773,000
Nebraska	77,500	1,296,000	Omaha	192,000
North Dakota	70,800	647,000	Fargo	22,000
Ohio	41,000	5,759,000	Cleveland	797,000
South Dakota	77,600	637,000	Sioux Falls	25,000
Wisconsin	56,100	2,632,000	Milwaukee	457,000

Questions. — 1. Find the average area of the states in this group. 2. How does this compare with the average for the Northeastern States? 3. What explanation can you suggest for the difference in size of the states in different sections of the country (Fig. 11)?

Distribution of population in these states. — Fig. 62 reminds one of the population map of the Northeastern States (Fig. 21) in the number of large centers of population. Of the twenty-five largest cities in the United States, ten are found in those states, while here there are nine. See if you can name the cities represented by the largest groups of dots. Since each dot stands for 10,000 population, you can tell which group of states has, on the whole, the larger cities. Which is it?

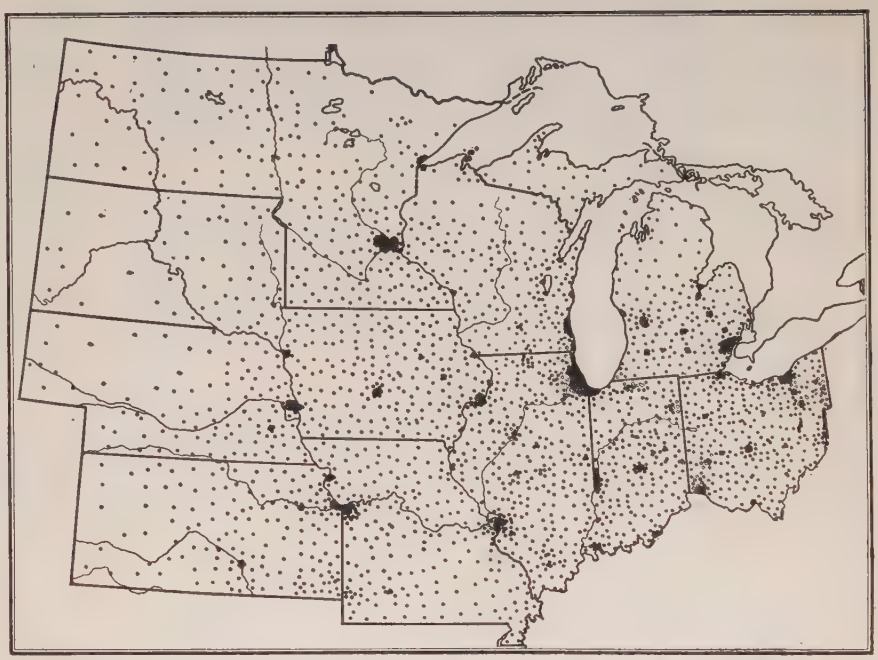


Fig. 62. — Distribution of population in the North Central States
Each dot represents 10,000 people.

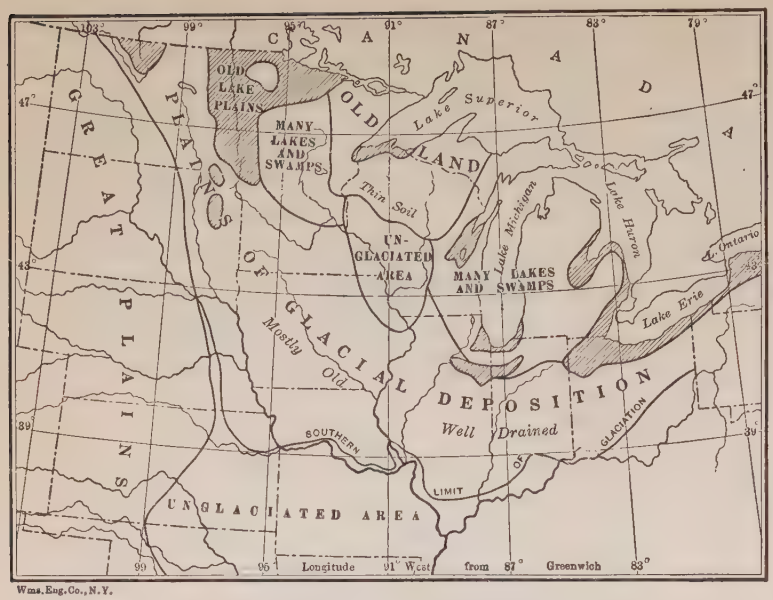
There is one very marked difference in the distribution of the people in the two sections. Many areas in the Northeastern States contain very few people; while in this group of states the population outside of the great cities is rather dense and evenly distributed, becoming gradually more sparse toward the west. Show that this is true. This suggests that the farm lands here are much more attractive than those of the other section. Let us see what their attractions are.

Comparison of these states with the Northeastern group in agricultural possibilities. — One disadvantage for agriculture stands out plainly in Fig. 18. As is explained on p. 237, the principal source of rain for this vast area is the Gulf of Mexico, and the eastern states in the group receive an abundant supply. Note the amount. Toward the west, however, the amount decreases, and west of a certain line the fall is less than twenty inches, which is too little for ordinary agriculture. Which states suffer in this manner? Note how close this line is to the one-hundredth meridian. The reasons for this lack of rain are stated on p. 131.

One disadvantage

In the Northeastern States there are many mountains, and the surface in other portions was left very uneven and strewn with bowlders by the Great Ice Sheet. This section does not share these disadvantages. The Black Hills are the chief mountainous area,

The great advantage in the character of the surface



Wms. Eng. Co., N.Y.

Fig. 63. — Land regions of the North Central States

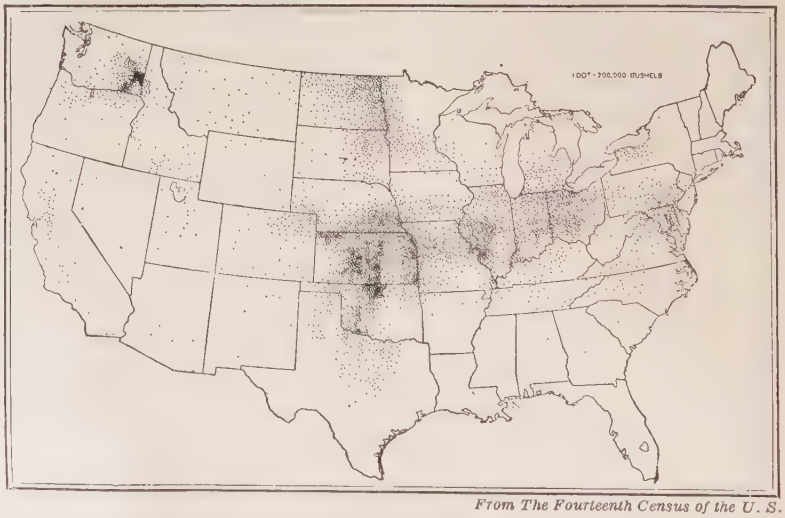
Cross lines indicate lake plains. "Plains of glacial deposition" are plains on which the Glacier, or Ice Sheet, *deposited* material which it had removed from districts farther north. Point out the two "unglaciated areas" where there is no evidence of action of the Ice Sheet.

and these are not extensive. Locate them. While Fig. 63 shows that a very large part of the land was covered by the Ice Sheet, it left much of the surface surprisingly level and free from rocks. Only in the neighborhood of the Great Lakes are there many lakes and swamps (Fig. 77). Which states have the most lakes? Most of the land that was not reached by the ice is also very level.

In one respect the Ice Sheet did great service to the farmers. For, while it scraped off so much of the surface in the area just south of Lake Superior that the soil is very thin there (Fig. 63), elsewhere it added to the soil much finely ground rock gathered from many places in its path and made a mixed soil of great fertility. Since the Ice Age, large quantities of plant remains have also become mixed with it, making it especially rich and giving it a dark color; in some parts of Illinois and Iowa the soil is almost black.

The advantage due to a more continental climate

Being a long way from the ocean, these states have a more *continental* climate than the Northeastern group. This means that they become hotter in summer and colder in winter, which gives them a very important advantage. In what two temperature belts do these states lie (Fig. 12)? They can raise all the crops that flourish in the Northeastern States, and, owing to the hotter summers, can grow others besides. For example, it is difficult for corn to mature there; but here it is one of the leading products.



From The Fourteenth Census of the U. S.

Fig. 64. — Wheat production, 1919

Locate each of the three most important wheat regions. What kind of wheat is produced in each? What is the rainfall in each?

Why these states may be called the granary of the United States. — Fig. 64 makes clear one reason why these states are sometimes called the granary of the United States. Which states take the lead in wheat raising? Which others raise a large amount? The United States is one of the chief wheat-producing countries of the world, growing from 600,000,000 to 1,000,000,000 bushels per year; and more than two thirds of the whole amount comes from these states. See how long a list you can make of the uses of wheat.

Courtesy of U. S. Dept. of Agric.

Fig. 65. — Husking corn from the standing stalks, Iowa

The cornstalks on some farms are cut and shocked in the fall and the ears are husked later from the shock. The stalks are fed to the cattle. The easier method is to husk the corn in the field and then turn the cattle into the field to eat the stalks.

Fig. 70 shows the *Corn Belt*, stretching from western Ohio to central Kansas and Nebraska, in which about one third of all the cultivated land is in corn. Name the states in the Corn Belt. What are the half dozen that grow the greatest amount? Note how much more is produced here than in the Northeastern States.

The United States is by far the leading country of the world in the production of corn, growing about 3,000,000,000 bushels per year; and about two thirds of our entire crop comes from these states. What uses of corn can you list?

In addition, these states lead in the production of oats. Three other crops, rye, barley, and flax, are grown more extensively here than in all our other states together.

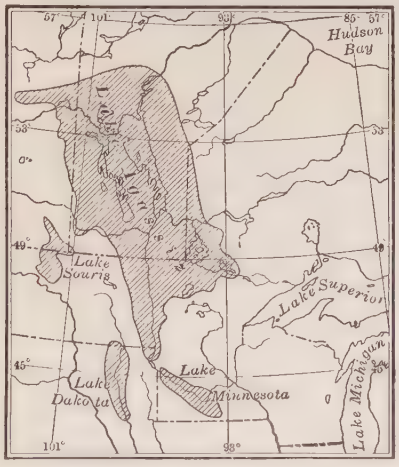


Fig. 66. — Ancient lakes in the wheat region

The traveler in this region in early summer sees luxuriant fields of grain on every hand. A cornfield usually presents the most beautiful appearance in July, when the corn tassels out. The plants as seen from a distance then entirely hide the ground from view, and the rich green stalks, with their long, slender leaves, bend to the breezes in the most graceful manner. The waving fields of wheat and oats, rich in color as they ripen, are hardly less beautiful.

Some of the reasons for the location of the wheat areas. — Fig. 64 shows that there is an important wheat area in North and South Dakota and Minnesota. *Spring wheat* is cultivated there, so called because it is planted in the spring. It flourishes best in a comparatively cool climate where the rainfall is not

great; and these states meet such conditions very fully.

In addition, they have a soil that can hardly be surpassed in fertility. One of the reasons for its excellence dates back to the time when the Great Ice Sheet was melting away. The ice then stretched across the valley of the Red River, which now flows northward into Canada. On account of the ice dam, this river was forced to seek an outlet to the south, instead of flowing north, and a vast lake, known to geologists as Lake Agassiz (Fig. 66), was thus formed. When the ice melted away from the valley, the river once more flowed northward and the great lake disappeared. The soil of the wheat region is the sediment that was deposited on the bottom of this ancient lake.

The land here is almost as level as a floor; so level, in fact, that after a rain the water stands in sheets on the fields. It is necessary to elevate the roads a foot or more and make ditches on each side; otherwise the roads would often be impassable. In every direction there is nothing to break the view, and one can plainly see the farmhouses with a few trees around them ten miles, or more, distant. One can ride through this region all day long on the train and see scarcely a single crop besides wheat.

An even more important wheat area is found in Kansas and Nebraska. There *winter wheat* is grown; this is planted in the autumn instead of in the spring. In states so far north as the Dakotas it is likely to be killed by the severe cold, but here it flourishes.

Courtesy of International Harvester Co.

Fig. 67. — Threshing in the North Central States

The machine near the middle of the picture is a separator, so called because it separates the grain from the straw. The men on the stack at the left pitch bundles into the separator. The grain is collected in bags on the right of the machine and the straw is blown out of the separator into a stack. This separator is being run by a gasoline tractor.

The story of a typical wheat farm in Kansas. — Let us study in some detail the experiences of the owner of a certain prairie farm in central Kansas. His farm has an altitude of 2,000 feet, and lies on the western edge of the Wheat Belt, where the rainfall is just about twenty inches. The altitude and rainfall permit wheat raising, but make it rather an uncertain crop. The soil, however, is fertile and there is no difficulty in raising a large crop if the rain does not fail. The farm is level and easily worked. These were the conditions as he found them.

Conditions that first confronted the farmer

At first his chief difficulty was lack of experience. In that dry country he attempted to raise crops just as he had raised them in the well watered country from which he had come. He had to learn, after many failures, that it was necessary to save moisture by special meth-

Some of his difficulties

ods of cultivation, somewhat similar to those described on p. 144 in the case of *dry farming* in the West.

When this farmer went West he took his seed wheat, which was adapted to a much damper climate. It could not thrive in the dry climate of these plains. Then some emigrants from southern Russia arrived, bringing wheat that had grown in the semi-arid climate of that country. It could stand drought in summer and cold in winter. Our farmer learned of this and secured Russian wheat for seed, with good results.

Other difficulties arose. The millers at first had no machinery for grinding hard wheat. Then, when they had changed their milling processes and were able to make wheat into flour, our farmer found that his wife did not know how to bake with the new kind of flour. It was really one of the very best kinds, because it contained a great deal of *gluten*, or nourishing substance; but it required practice before she learned how to use it.

Some years he had a good crop, but could not sell it for enough to pay expenses. Other years the weather was dry and he had no crop at all. Some years the crops were destroyed by grasshoppers and chinch bugs; and some years he sold large crops at a good profit.

Courtesy of U. S. Dept. of Agric.

Fig. 68. — A farm in the western part of Kansas

The stacks of hay in the foreground have been taken from the surrounding fields. Corn is seen growing just beyond. Both corn and hay are raised on the level ground. The broken, hilly land in the background is used for pasture, while the trees along the stream furnish shelter for the live stock. This is in the Great Plains, where there are few trees except along the streams. How many farmhouses can you see? What is the rainfall in this part of the United States (Fig. 18)?

All this time he and his family were working with might and main. They kept cows and sold butter in the neighboring village. They had pasture land and kept beef cattle to sell in the fall. They raised garden vegetables and watered them in dry weather from the well.

How the family worked, and the outcome of their struggles

After a time conditions began to improve. The wheat sold at a higher price, and other farm products kept pace with it. Little by little the secrets of soil, seed, cultivation, and climate were learned. The children grew up and worked in the fields. Finally enough money had been saved to buy more land. This farm now contains several thousand acres; after thirty-five years of labor its owner has retired from active work, and his sons and sons-in-law have taken over the farm management. When you know his story, you know that of many hard-working, persevering, intelligent men of the Wheat Belt, who have made good homes on land that was once considered fit only for grazing.

They raise other grains on the farms now, but wheat is still the chief crop. If possible, the men begin to plow in July and continue through August. On the farms are many horses, but the plowing is done mostly by steam or gasoline tractors. Each engine

Getting the crop well started

pulls from three to ten plows and can do the work of many horses. The harrowing is done as soon as possible after plowing, to prevent escape of moisture. This is done mainly with horses.

When the weather and other conditions are favorable, the seeding is done in late September and early October. For this purpose wheeled drills are used, which deposit the seeds in rows about six inches apart. From twelve to sixteen rows are planted at a time. A drill is usually drawn by three horses.

Courtesy of International Harvester Co.

Fig. 69. — A binder at work

If the weather is good the little plants come up quickly and within ten days can be seen across the fields. Before cold weather comes the fields are green. Sometimes the winters are dry and cold. The wheat then withers, the fields look brown, and fierce winds are likely to blow the soil away from the roots. After such a winter the spring sometimes opens with terrible dust storms, strong winds gathering the fine soil from the fields and carrying it away in clouds that darken the sky. It lodges in drifts by fences and hedges, and sometimes not a trace of wheat is left in the fields. Then there is nothing to do but to plant the land in spring crops, such as oats, barley, or sorghum.

Let us suppose that the wheat has "come through the winter well," as the crop bulletins express it. By March it should be strong and green. When it fully covers the ground, there is no longer danger from high winds because the dust cannot then be raised so easily. If rain is plentiful, the wheat grows rapidly and by the last of May is two to three feet high.

Dangers shortly before harvest

The month of June is critical. The grains are forming then, and if the weather is too dry and hot they shrivel and become inferior. A sudden dry spell with hot winds just as the grain is ripening will in a few days destroy the prospects for a bumper crop. If there is too much rain, the straw becomes too luxuriant, and there is little grain.

Let us suppose again that the wheat has come through all the trials of cold weather, high winds, spring drought, and early summer heat and rain, and that the crop is ready for harvest. That begins from the tenth to the twentieth of June, and is usually over by the tenth of July. In twelve to twenty days the farmers gather in the results of the year's work. The harvesting may be done with machines called *headers*, so named because they cut off the heads of the grain, leaving the stems or straws standing; several wagons may be necessary to haul to the stack the heads cut by one header, or *binders* may be used, which both cut and bind the grain.

Method of harvesting

No farmer has help enough on his farm to do the work of harvest in good crop years. On that account men from outside the Wheat Belt are brought in, great numbers of them and all kinds — college boys, factory hands, and even tramps.

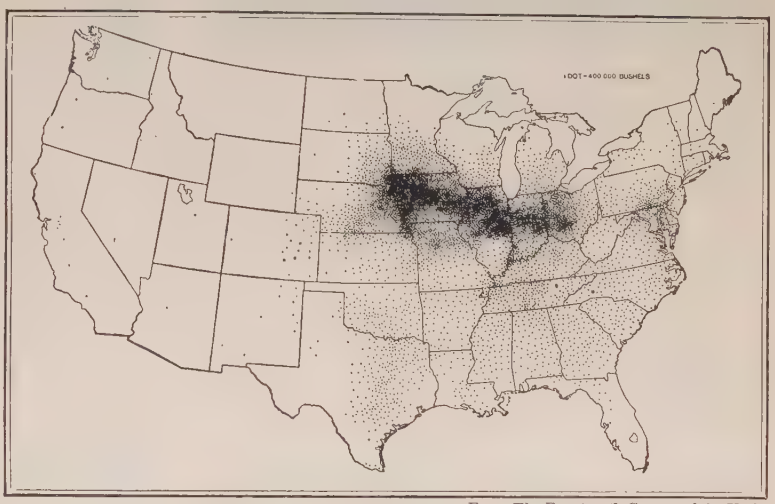
Early in July the wheat should all be in the stack; then threshing takes place. Many farmers have their own threshing outfits. Others have the threshing done by contract. The owner of an outfit comes to the farm with his equipment and his help and delivers the threshed grain at a certain price per bushel. He usually has a traction engine, a *separator*, a water wagon, and a "cook shack." The separator threshes out the grain at the rate of 1,000 or even 2,000 bushels per day. On some of the largest wheat farms, however, the modern *combined harvester* is used, which cuts, threshes, and sacks the grain as it moves across the field.

Method of threshing and marketing

The wheat, instead of being sacked, is often hauled to market in light wagon boxes, each holding about fifty bushels. When the load comes to the grain elevator at the country station, it is weighed. Then it goes to a dump where the front of the wagon is elevated until the wheat runs out of the box into a pit underneath. From there it is elevated by machinery into the high bins of the building; and thence it is later run through spouts into freight cars standing on the tracks beside the elevator.

Prosperous farmers have storage capacity on their farms for a large part of their crop, if they wish to hold the wheat until the price is better. On many farms it is stored in sheet-iron structures resembling water tanks. These stand on a foundation of wood or concrete and must be proof against moisture and vermin. Many farmers have a large amount of wheat on hand most of the time, and, of course, the price of wheat is closely watched from day to day.

Reasons for the location of the Corn Belt.— While Fig. 70 shows that corn is widely cultivated in the United States, very little is grown in the extreme northern and western portions of this section. The land here is very level, like that farther east, but it is much higher; there is, in fact, an upward slope all the way from the Mississippi River to the foot of the Rocky Mountains. The products of this elevated, semi-arid area just east of the Rockies, which is called the *Great Plains* (Fig. 63), are quite different from those east of the one-hundredth meridian. The nights are too cold for corn because of the high altitude and latitude. Lack of rain in this region is another barrier to its cultivation (Fig. 18).



From The Fourteenth Census of the U. S.

Fig. 70.— Corn production, 1919

Corn requires a frostless season of not less than 140 days, and at least thirty inches of rain. It grows most rapidly during hot, "muggy" spells, and matures best where the cool days and nights of autumn check the growth of stalk and leaves and thereby aid

in the ripening of the grain. All these conditions are especially well met in the Corn Belt. What brings the much needed rain is discussed on p. 237.

Courtesy of U. S. Dept. of Agric.

Fig. 71. — A sugar-beet digger at work

Machines have been made for nearly every kind of work on our farms. This machine is run by a gasoline engine.

Use of farm machinery in these states. — In Ohio in 1920 the farms averaged 92 acres; in Illinois, 135; in Iowa, 134; in Nebraska, 186; and in North Dakota, 316. This is in striking contrast with the size of farms in Japan, which average about one acre in extent — a fact which suggests that most of the work is done by hand. Without the aid of machinery there would be no way to cultivate so much land. However, the level surface, the firm soil, and the nature of the crops all allow its free use, and an enormous number of machines is now found on these farms.

The need of machinery in the cultivation of large farms

Where formerly a spade or a single plow might have been used for stirring the soil, *gang plows* are now common. A gang plow is nothing more than a group of several plows drawn by horses, or, oftener, by a steam or gasoline tractor. It is not uncommon to see a tractor drawing at one time a gang plow, a harrow to break up the clods and level the surface, and a seeder for planting the grain.

All this region might still be the pasture of the buffalo, if labor-saving machinery had not been invented. Thousands of years ago our ancestors in the Old World cut wheat with a hand sickle. A hundred years ago grain was still cut by hand, an improved implement called the *scythe and cradle* being in common use. The grain was threshed out by being beaten with clubs; it was then separated from the chaff by throwing both into the air and letting the wind carry the latter away.

These methods did not change until about eighty years ago. Then American inventors produced a horse-drawn *reaper*. With the hand sickle a quarter of an acre had been a good day's work; with the scythe and cradle, two acres; but with this machine a man could cut ten or twelve acres per day. The grain still had to be bound into sheaves by hand.

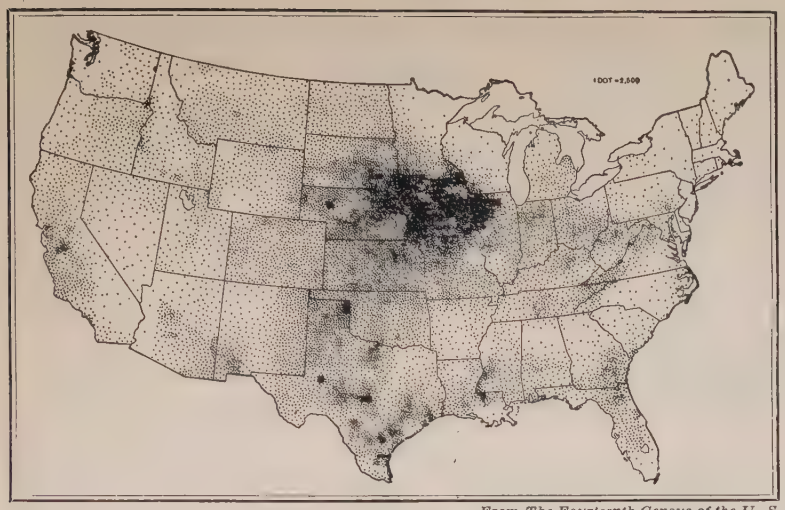
Some of the kinds of farm machinery, and their advantages

By the time the prairies were extensively cultivated for grain, the other harvesting machines were invented whose use we have already discussed. The result is that by the aid of horse power and machinery one man

Courtesy of U. S. Dept. of Agric.

Fig. 72. — A corn picker at work in Iowa

Corn is the chief crop in Iowa. Only by use of machinery could such a large quantity be raised on each farm. This machine removes the ear from the stalks, husks it, and drops it into the wagon box.



From The Fourteenth Census of the U. S.

Fig. 73. — Beef cattle, 1920

can easily do twenty times as much as could be done in the olden times. In fact a farmer can now probably raise a hundred acres of wheat as easily as the farmer of ancient times could raise one. The final advantage is that a hundred persons can now have white bread where formerly there was only enough for one.

Machines are now used for harvesting corn, for loading hay and storing it in barns, for spreading fertilizer, and for a great number of other purposes. Without the aid of machinery the North Central States would produce only a very small part of their present crops.

Contribution of these states to our meat supply. — Meat is almost as necessary a food as flour. Let us see the extent to which these states produce it. Fig. 73 shows the distribution of beef cattle. Which of these states are most prominent in cattle raising? In Fig. 230 the leadership of this section in production of pork is shown to be even more striking. Note the states that have the largest number of swine. Poultry, also, because of its double value for meat and for eggs, is an important product.

Corn and other grains are the chief food of cattle, hogs, and poultry. The cattle eat not only the grain, but the stalk of the corn as well. If it is to be used as fodder in winter, it is cut before frost, when the kernels on the cob are still somewhat soft and milky. If it is to be used for winter feed, it is likewise cut early, chopped up, and stored in the silo; it is then called *ensilage*. Corn is so valuable for fattening that many cattle raised on the Great Plains are sent to the corn states to be fattened before being marketed. The states of the Corn Belt are also prominent in the production of hay and other food for cattle.

These facts largely explain why the North

Fig. 74. — Kafir corn in Kansas

Kafir corn is a sorghum grown for its seed and for fodder in the regions of little rain. For other crops grown in such regions see p. 144.

Central States supply most of our meat, and in particular why this meat comes mainly from the Corn Belt.

The prominence of dairying, and reasons for its development. — How do these states compare with the Northeastern group in dairying? Fig. 231 answers that question, so far as the value of dairy products put on the market is concerned. What is the answer?

By comparing Fig. 70 with Fig. 231, you find that dairying is most prominent a little to the north of the Corn Belt. What large cities must help to determine this location? The cool summers there also favor the dairy industry. In spite of the importance of dairying in New York (p. 55), Minnesota and Wisconsin have more creameries than any other two states, and the Elgin market in northern Illinois has long fixed the price of butter for most of our country.

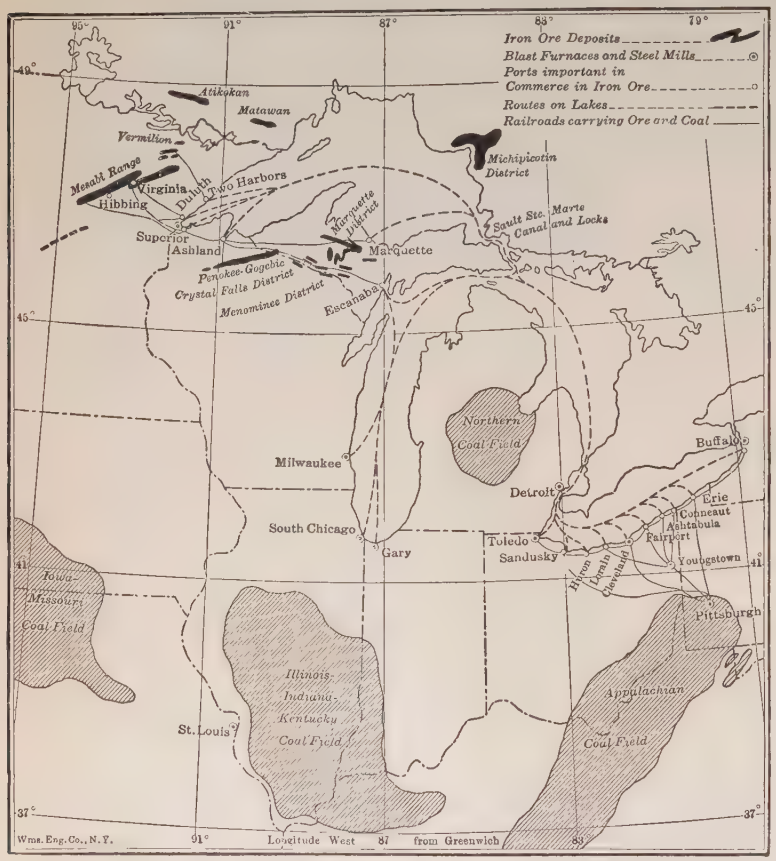


Fig. 75. — Iron ore and coal in the North Central States and near-by sections

Trace the route of a ton of iron ore from the Mesabi Range to Pittsburgh; to Gary. What upper lake ports ship iron ore? What lower lake ports receive the ore? Name the regions producing iron ore. From where does Gary receive most of its coal? What are the advantages for iron and steel making at Duluth?

Prominence of manufacturing. — Since the North Central States are the granary of our country and supply a large share of our meat and dairy products, one might conclude that most of the people were farmers. Yet only about half the population live on farms; and it should be remembered that out of the twenty-five largest cities in the United States, nine are located in this section (p. 481).

As manufacturing is one of the principal explanations for the gathering of many people in cities, a large amount of it must be done here. In fact, these states rank next to the Northeastern group in that industry, producing about four fifths as many goods in value.

How the supply of power favors manufacturing. — Gas and oil are found in Ohio and Indiana, but the supply has greatly decreased in recent years. Water power is by no means so abundant as in the Northeastern States, because most of the land is comparatively level. Yet such power is available in many places. One of the greatest power dams in

the world is located across the Mississippi River at Keokuk, about 150 miles north of St. Louis. The dam is about one mile in length, and the electric power produced is nearly one half that produced at Niagara Falls (p. 34). It is transmitted to many towns in Iowa, Illinois, and Missouri, and a large part of it is used for driving street cars and machinery in St. Louis.

The chief source of power for manufacturing, however, is soft coal, of which there is an abundance. Fig. 75 shows how well it is distributed. Which states are best supplied? Which states are so far from it that their industries are likely to suffer? Name several cities in these states that are very near coal beds. Estimate some of the distances.

How means of transportation favor manufacturing and commerce. — Easy and cheap means of transportation are always necessary for extensive manufacturing and trade. How well supplied is this region in this respect?

© Ewing Galloway

Fig. 76. — Where freight cars and lake vessels meet

These docks are at Cleveland. Lake Erie is seen in the background. Note also the breakwater and the opening in it to permit the passage of vessels into and out of the harbor which it forms.

Fig. 11 shows what an abundance of navigable waterways is furnished by the rivers. Name and locate the states most benefited by them. Before the opening of the old Erie Canal and the construction of railroads, large quantities of wheat, corn, and other products were floated down the Mississippi and its tributaries to New Orleans and then shipped to our eastern coast or abroad. These rivers were then far more important for transportation than the Great Lakes.

The early use of waterways

When, however, in 1825, the Erie Canal provided cheap transportation to the Atlantic coast, these rivers began to lose their lead. Then other canals were constructed, connecting the rivers in the state of Ohio with Lake Erie; and the Great Lakes route became more and more important, until the traffic upon it far surpassed that of the rivers.

Meanwhile railroad building began, the level surface making construction much cheaper here than in the Northeastern States. Fig. 233 shows the great extent of the railroads to-day. While the entire country has about 250,000 miles of railroad, these states alone have nearly 100,000, which is much more than their share. The most important roads run east and west, but many parallel the large rivers and haul goods that could easily be carried by water. For many years the rivers have been little used for transportation; and the railroads have even diverted considerable traffic from the lakes. Trans-

Extent to which railroads have taken the place of waterways

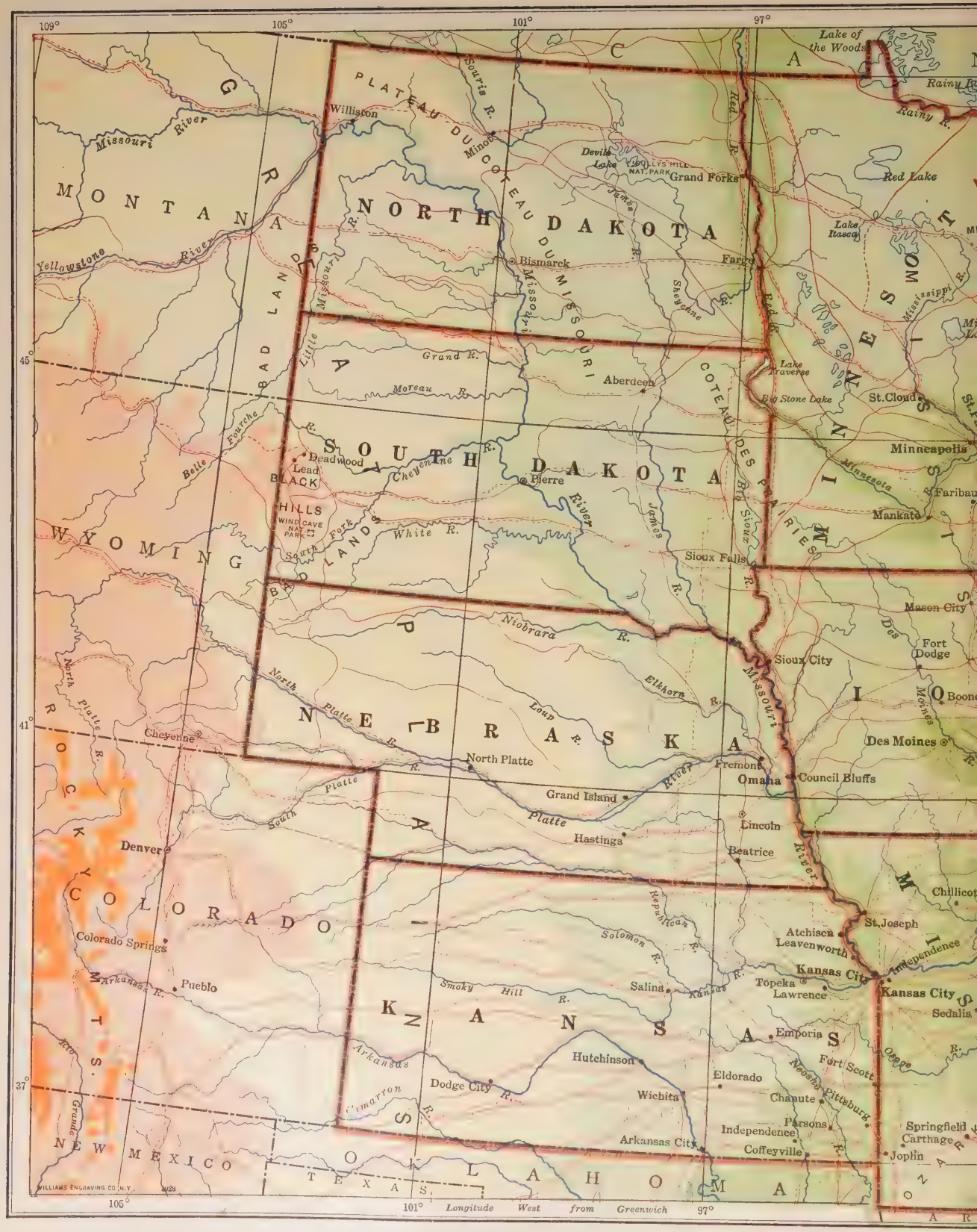
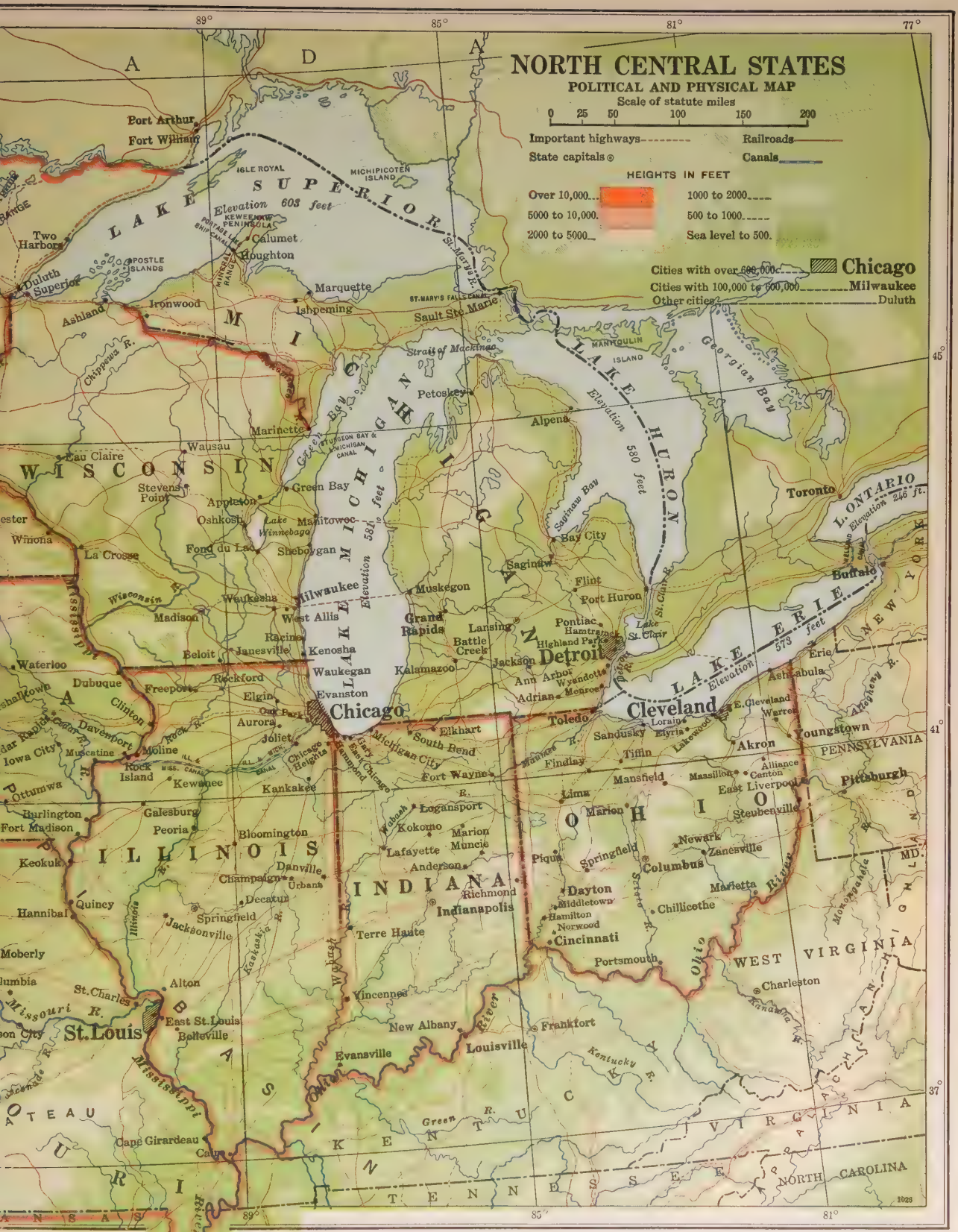

109°
105°
101°
97°
45°
41°
37°
Lake of the Woods
Rainy R.
Red Lake
Lake Itasca
Mississippi R.
Souris R.
Red R.
Williston
PLATEAU DU COTEAU DU MISSOURI
Devils Lake
TURTLE MTS. NAT. PARK
Grand Forks
James R.
Fargo
Bismarck
Missouri R.
Sheyenne R.
Missouri River
MONTANA
NORTH DAKOTA
MINNESOTA
Yellowstone River
BAD LANDS
Little Missouri R.
Grand R.
Moreau R.
Aberdeen
COTEAU DES PRAIRIES
Lake Traverse
Big Stone Lake
St. Cloud
Minneapolis
Minnesota R.
Faribault
Mankato
Fourche Belle R.
Deadwood
Lead
BLACK HILLS
WIND CAVE NAT. PARK
South Fork Cheyenne R.
Pierre
White R.
James R.
Big Sioux R.
Sioux Falls
SOUTH DAKOTA
WYOMING
BAD LANDS
Niobrara R.
Mason City
Des Moines R.
Fort Dodge
Sioux City
Missouri R.
Elkhorn R.
North Platte R.
Loup R.
Boone
Moines R.
Des Moines
NEBRASKA
North Platte
Fremont
Omaha
Council Bluffs
Grand Island
Platte River
Lincoln
Hastings
Beatrice
Chillicothe
Denver
South Platte R.
Platte R.
ROCKY MTS.
COLORADO
Colorado Springs
Arkansas R.
Pueblo
Republican R.
Solomon R.
Atchison
Leavenworth
St. Joseph
Independence
Kansas City
Topeka
Lawrence
Kansas R.
Smoky Hill R.
Salina
KANSAS
Emporia
Sedalia
Osage R.
Hutchinson
Fort Scott
Neosho R.
Pittsburg
Eldorado
Dodge City
Arkansas R.
Cimarron R.
Wichita
Chanute
Parsons
Springfield
Carthage
Independence
Arkansas City
Coffeyville
Joplin
Canadian R.
Rio Grande
NEW MEXICO
OKLAHOMA
TEXAS
WILLIAMS ENGRAVING CO. N.Y.
Longitude West from Greenwich

Fig. 77


NORTH CENTRAL STATES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 25 50 100 150 200
Important highways
Railroads
State capitals
Canals
HEIGHTS IN FEET
Over 10,000
1000 to 2000
5000 to 10,000
500 to 1000
2000 to 5000
Sea level to 500.
Cities with over 500,000
Chicago
Cities with 100,000 to 500,000
Milwaukee
Other cities
Duluth
LAKE SUPERIOR
Elevation 603 feet
LAKE MICHIGAN
Elevation 581 feet
LAKE HURON
Elevation 580 feet
LAKE ERIE
Elevation 573 feet
ONTARIO
Elevation 246 ft.
WISCONSIN
ILLINOIS
INDIANA
OHIO
PENNSYLVANIA
WEST VIRGINIA
KENTUCKY
TENNESSEE
MISSOURI
Port Arthur
Fort William
Two Harbors
Duluth
Superior
Ashland
Ironwood
Marquette
Calumet
Houghton
Sault Ste. Marie
Petoskey
Alpena
Marinette
Wausau
Eau Claire
Green Bay
Appleton
Oshkosh
Manitowoc
Sheboygan
Fond du Lac
La Crosse
Milwaukee
Madison
Racine
Kenosha
Beloit
Janesville
Waukegan
Evanston
Chicago
Aurora
Joliet
Elgin
Rockford
Freeport
Dubuque
Waterloo
Davenport
Moline
Rock Island
Muscatine
Iowa City
Kewanee
Galesburg
Peoria
Bloomington
Danville
Champaign
Urbana
Decatur
Springfield
Jacksonville
Quincy
Hannibal
Alton
St. Louis
East St. Louis
Belleville
Cape Girardeau
Kankakee
Gary
Hammond
East Chicago
Michigan City
South Bend
Elkhart
Fort Wayne
Kokomo
Marion
Muncie
Lafayette
Logansport
Terre Haute
Indianapolis
Richmond
Anderson
New Albany
Evansville
Louisville
Grand Rapids
Muskegon
Kalamazoo
Battle Creek
Lansing
Jackson
Detroit
Ann Arbor
Ypsilanti
Wyandotte
Monroe
Adrian
Pontiac
Flint
Saginaw
Bay City
Port Huron
Toledo
Sandusky
Elyria
Lorain
Cleveland
E. Cleveland
Akron
Canton
Alliance
Youngstown
Warren
Ashtabula
Erie
Buffalo
Toronto
Findlay
Tiffin
Fremont
Mansfield
Massillon
East Liverpool
Steubenville
Pittsburgh
Lima
Piqua
Springfield
Dayton
Middletown
Hamilton
Norwood
Cincinnati
Columbus
Newark
Zanesville
Marietta
Chillicothe
Portsmouth
Charleston
Frankfort
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Lake Winnebago
Lake St. Clair
Saginaw Bay
Georgian Bay
Strait of Mackinac
Mississippi R.
Missouri R.
Ohio River
Wabash R.
Illinois R.
Kaskaskia R.
Kentucky R.
Green R.
Tennessee R.
Cumberland R.
Monongahela R.
Allegheny R.
Maumee R.
Sandusky R.
St. Clair R.
Detroit R.
Niagara R.
Genesee R.
Chippewa R.
Wisconsin R.
Rock R.
Illinois and Michigan Canal
Sturgeon Bay & Lake Michigan Canal
Portage Lake Ship Canal
St. Mary's Falls Canal
Welland Canal
Erie Canal
Isle Royale
Keweenaw Peninsula
Michipicoten Island
Manitoulin Island
Apostle Islands
Mesabi Range
Vermilion Range
Cuyahoga Falls
Lorain
Elyria
Sandusky
Lakewood
Warren
Canton
Alliance
East Liverpool
Steubenville
Zanesville
Marietta
Chillicothe
Portsmouth
Middletown
Hamilton
Norwood
Richmond
Anderson
Muncie
Marion
Logansport
Kokomo
Lafayette
Terre Haute
Jacksonville
Springfield
Decatur
Champaign
Urbana
Danville
Peoria
Galesburg
Burlington
Fort Madison
Keokuk
Hannibal
Quincy
Moberly
Columbia
Ottumwa
Iowa City
Muscatine
Davenport
Moline
Rock Island
Kewanee
Kankakee
Joliet
Aurora
Elgin
Oak Park
Rockford
Freeport
Dubuque
Waterloo
Janesville
Beloit
Racine
Kenosha
Waukegan
Evanston
Chicago
West Allis
Madison
Waukesha
Milwaukee
Muskegon
Grand Rapids
Lansing
Battle Creek
Kalamazoo
Jackson
Detroit
Ann Arbor
Ypsilanti
Wyandotte
Monroe
Adrian
Pontiac
Flint
Saginaw
Bay City
Port Huron
Toledo
Sandusky
Elyria
Lorain
Cleveland
E. Cleveland
Akron
Canton
Alliance
Youngstown
Warren
Ashtabula
Erie
Buffalo
Toronto
Findlay
Tiffin
Fremont
Mansfield
Massillon
East Liverpool
Steubenville
Pittsburgh
Lima
Piqua
Springfield
Dayton
Middletown
Hamilton
Norwood
Cincinnati
Columbus
Newark
Zanesville
Marietta
Chillicothe
Portsmouth
Charleston
Frankfort
Louisville
Evansville
New Albany
Vincennes
Terre Haute
Indianapolis
Richmond
Anderson
Muncie
Marion
Logansport
Kokomo
Lafayette
Fort Wayne
Michigan City
South Bend
Elkhart
Gary
Hammond
East Chicago
Calumet
Houghton
Marquette
Ishpeming
Ironwood
Ashland
Duluth
Superior
Two Harbors
Port Arthur
Fort William

Questions on Fig. 77. — 1. Locate five canals. Discuss the usefulness of each of them. 2. Which cities appear to you to owe their importance partly to the fact that they are railroad centers? 3. What states or portions of states that appear on this map are outside the limits of the North Central States (Fig. 19)? 4. If you wish to look up smaller places than are shown here, consult Fig. 499 or 501.

portation on the Great Lakes is largely confined to the shipment of heavy and bulky articles like iron ore, grain, lumber, and coal. Mississippi River on both sides. What important lake ports are directly reached from this city by rail (Fig. 77)?

While there are no coal mines in this vicinity (Fig. 75), the Falls of St. Anthony in the Mississippi River supply a great quantity of power to Minneapolis and St. Paul (often referred to as the *Twin Cities*). This fact, together with the abundance of wheat, has favored the manufacture of flour.

Influence of wheat on manufacturing in Minneapolis

© *Detroit Publishing Co.*

Fig. 78. — The flour-milling district, Minneapolis

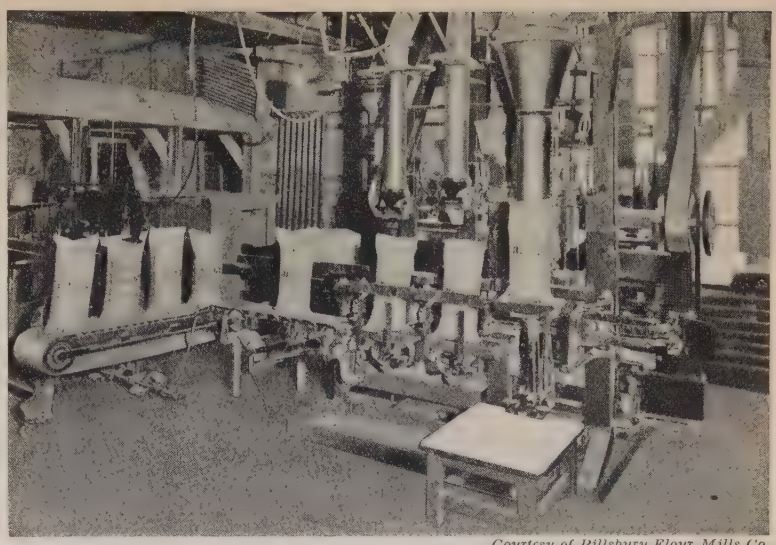
Influence of agriculture on the "Twin Cities." — Minneapolis is one of the greatest wheat markets in the world, being on the eastern edge of our northern wheat section. Most of the grain goes East or Southeast. It has over fifty elevators averaging a capacity of nearly 1,000,000 bushels each. Fig. 77 shows what a great rail center this locality is, the railroads even paralleling the

Influence of wheat on the commerce of Minneapolis

Business men have made full use of this advantage, for they have introduced machinery that has revolutionized the whole milling process. The Bible speaks of two women sitting at a mill, which calls up a picture that can still be seen in backward parts of the world. The mill consists of a lower millstone resting upon the ground, with a spindle in the center extending up through

1. Former milling processes

the center of another stone resting on the first. The upper stone has a handle by which one of the women turns it on the lower, while the other woman drops the grain in handfuls through the opening around the spindle. It falls down and is ground between "the upper and the nether millstone." The crushed grain is then gathered up and sifted, so that the husk or *bran* is separated from the white interior of the grain. The product is a very coarse kind of flour.



Courtesy of Pillsbury Flour Mills Co.

Fig. 79. — Filling cloth sacks with flour at one of the great flour mills in Minneapolis

The flour is weighed automatically and is then dropped through the large pipes into the sacks. These are moved along and pass by sewing machines which sew them up ready for shipment. Such machines as these increase production and save money to the consumers.

The flour eaten by our grandparents was only a little better. It was made in a crude little building beside some stream, called a *grist mill;* the power used was a creaking water wheel that turned very lazily. The farmer boy carried the grain in a bag, horseback, to the mill, and loitered about while the miller ground the grist. The miller had no particular skill, the wheat was poorly cleaned, and the mill was exposed to the dust. He ground the grain, however, sifted out the flour, took a portion as toll for his work, and put the remainder back into the sack. Then the boy took it home for the family bread.

Only about fifty years ago the process of roller milling was invented, and flour became a very different article.

Modern milling machinery cleans the grain by removing all dust, seeds of weeds, and other foreign particles of every sort, and even the grains of wheat that are too light. The grains are so cleansed and scoured that when they go to the rollers to be ground they shine like gold.

2. The modern process

The first set of rollers between which they pass barely cracks the grains; the next breaks them a little finer; and as they pass on each set breaks them a little more, until they are crushed into the finest flour.

In the meantime the bran has been removed, and the different grades of wheat have been separated from one another by machinery. The finished product is then sacked, even the bags being sewed up by machinery. All this time skilled workmen have been watching every process, yet no one of them has touched the flour with his hands. Such care in the manufacture of flour is a great protection to health; and so much labor and so much wheat substance are saved that these machines, like the improved farm implements, allow many persons to eat white bread where formerly only one could obtain it.

After the invention of the roller process Minneapolis soon took the lead in the manufacture of flour, and to-day its only rival in that industry is Buffalo, New York.

Other manufactures of Minneapolis are breakfast foods made from grain; linseed oil, obtained from flax grown mainly in North Dakota and Minnesota; and agricultural implements that are required by the farmers in the neighboring states.

Influence of agriculture on other industries of St. Paul and Minneapolis

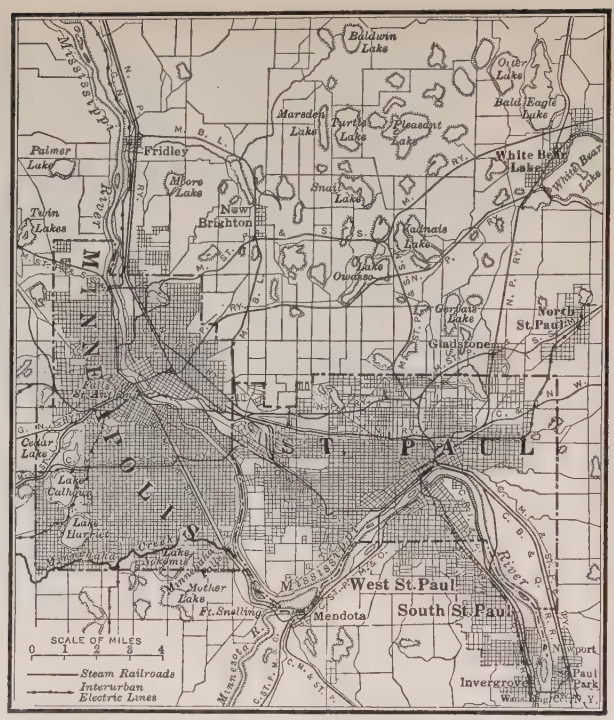


Fig. 80. — The Twin Cities

For an explanation of the number of lakes in this small area, see p. 10.

St. Paul, on the other hand, is distinguished as one of the leading horse markets of the country, horses being still in much demand on the farms; it is also one of the prominent markets for cattle, with extensive stockyards and packing houses. It manufactures shoes, machinery, and refrigerators as well as many other articles for the use of the farming population of the Northwest. It is also a leading publishing center.

Both cities are centers for the surrounding country, for wholesale trade supplying lumber and lumber products in enormous quantities, and clothing and many other manufactured articles from the East. In short, their two great occupations, manufacturing and commerce, are largely the result of the farm products and farm needs about them.

Influence of agriculture on other cities west of the Mississippi River. — Other cities west of the Mississippi River are dependent on the surrounding country in much the same degree. Everywhere there are cattle and hogs, as shown in Figs. 73 and 230, and the large cities are noted for their live stock and meat packing. Many sheep out of the vast number raised on the drier lands farther west (Fig. 166) are sent to the Twin Cities to be

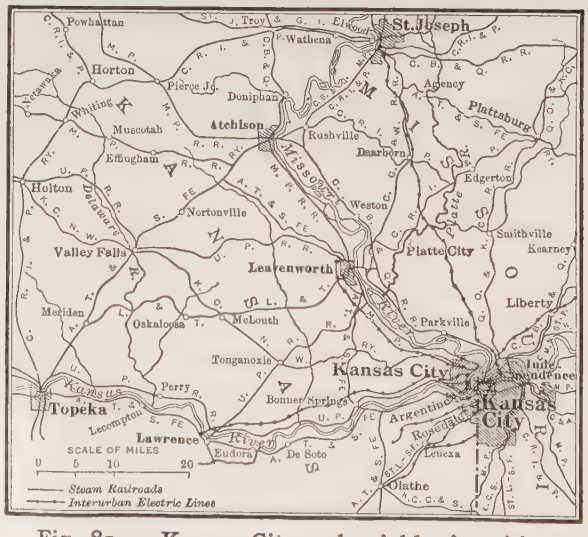


Fig. 81. — Kansas City and neighboring cities

In what two states does the area covered by this map lie (Fig. 77)?

slaughtered. Next to Chicago, Omaha, Kansas City, and St. Louis are the leading centers for live stock, although Sioux City in Iowa, St. Joseph in Missouri, and Wichita in Kansas each handles many thousands of animals per year. Locate these cities.

Practically every small town has a grain elevator, and the cities are centers for grain and milling. Kansas City and its namesake across the line in Kansas, being close to the winter-wheat section, are especially noted for grain and flour. All these cities resemble Minneapolis and St. Paul as trade centers for the surrounding country.

Why St. Louis is the largest of these cities. — The location of St. Louis on the Mississippi River near the mouth of the Missouri and also that of the Ohio places it in the center of a vast extent of waterways reaching northwest, northeast, and south. Trace these routes on the map. In the days before railroads this was a great advantage and gave the city a lead over all other points in this region. While the railroads now do most of the carrying, the rivers are still of some importance, and the city has retained its leadership.

It has extensive stockyards, as we have just noted, and large flour mills; it is also one of the great horse and mule markets of the world, and one of the leading markets for tobacco and wool. While it manufactures tobacco products extensively, its greatest manufacturing industry is that of shoes; and it is an important center for the distribution of dry goods, furniture, and hardware. Can you explain the reasons for extensive trade in these particular goods?

One important interest it has inherited. In the early days when it was connected by water with vast and little known regions where game was abundant, it became distinguished as a fur trading post. Although there is now little game near at hand, it is still a center for the collection of furs from every continent in the world.

Courtesy of St. Louis News Survey

Fig. 82. — In the heart of the business section of St. Louis

Why Chicago is the largest city of the Middle West. — Chicago is three and a half times as large as the largest city in the Mississippi Valley, and surpasses all other cities in the North Central States much as New York surpasses those in the Northeastern States. In fifty years its population has grown from about a half million to nearly six times that number. What has led to such remarkable growth?

There are three facts about its location that give Chicago a great advantage for trade in farm products. In the first place,

it is not far from the center of a remarkably productive agricultural region. The leading wheat region lies to the northwest, the Corn Belt is close at hand, and the dairy section is very near.

The superiority of the location of Chicago for trade in farm products

Second, the railroads connecting our northwestern states with the Northeastern group must pass around the southern end of Lake

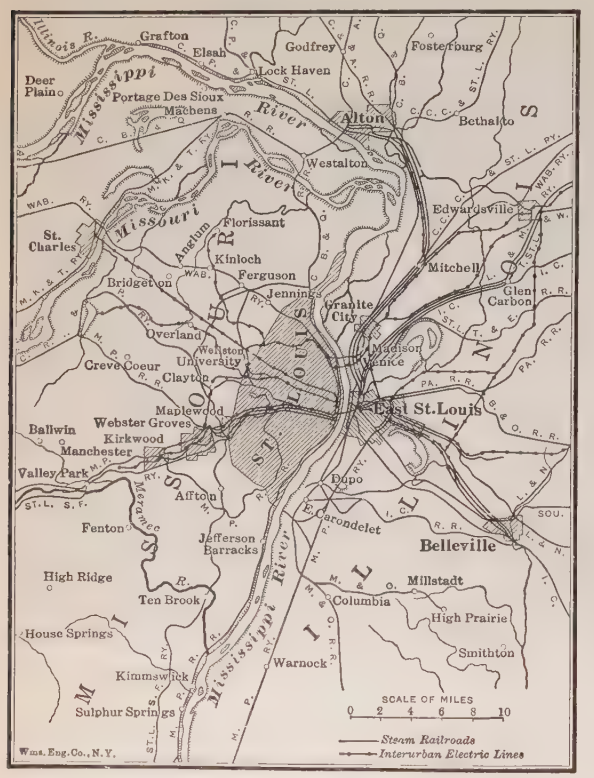


Fig. 83. — St. Louis and vicinity

How far distant is the mouth of the Ohio River (Fig. 77)?

Michigan. There is no route farther north that they can readily take. Also, goods bound for the East from districts west and southwest of Chicago can most easily go by way of the same city. Thus Chicago is a natural meeting place for routes connecting the East and the West and has become the greatest railroad center in the world. More than thirty important railroads have their terminals in that city. Yet no railroad passes through either Chicago or St. Louis, though Pennsylvania Railroad trains pass directly through New York, a much larger city, on their way from Washington and Pittsburgh to Boston. How must this fact affect the handling of freight in Chicago and St. Louis?

With these advantages, it is not strange that Chicago has more trade in farm products than any of the other cities of this section. While Minneapolis is the greatest wheat market, Chicago is the greatest grain market, its trade in corn, oats, and other grains besides wheat being very extensive. It receives larger shipments of live stock and sends forth more meat products than any other city in the world.

The Union Stockyards, where the cattle, sheep, and hogs are received and where the meat is packed, surpass anything else of the kind in the world. The yards and factories are so complete an organization that they resemble a city in themselves; and that section of Chicago has come to be known as Packingtown. It is worth a day's visit. Over 60,000 men are employed there, and the products have an annual value of nearly a billion dollars.

A day's happenings at the Union Stockyards

1. Extent of the yards

We might start the day by getting a bird's-eye view of the stockyards from the roof of one of the high buildings near by. One of the most impressive sights is the large number of railroad tracks and puffing engines. Twenty-five railroads deliver a total of 800 carloads of stock a day to these yards. If all the cars were in one train it would be nearly eight miles long. You will also see hundreds of pens or small yards containing the cattle, sheep, and hogs which have been unloaded from the cars. These are the stockyards; they occupy about 500 acres,

or an area nearly a mile square. The numerous buildings around the borders of the yards are the plants of the packers, where the animals are killed and dressed for market. You will also notice a network of runways or passageways leading from the pens to the various factories.

Fig. 84. — A few of the cattle pens at the Union Stockyards

2. The handling of the animals

Let us watch a carload of stock being unloaded into one of the pens. The unloading is sometimes difficult because the animals become frightened at the bustle and commotion. We shall find representatives of the packing companies on hand to look them over and arrange to buy them from the brokers or sellers. More than 50,000 head a day are thus bought in the Chicago yards.

Suppose we follow a group of hogs which have been purchased for one of the packing companies. We shall see them being driven along the runway leading to a packing house on the edge of the yards, and then up an inclined runway to the top of the building. After they have been given a shower bath and allowed to rest they are ready to be prepared for market. They are suspended from an overhead carrier by a chain and by it passed from man to man, being killed, scalded, scraped, and further prepared for the market, until finally a government inspector examines the meat to make sure that it is in good condition.

Chicago Aerial Survey Co.

Fig. 85. — An airplane view of part of Chicago

The large building on the left is the Wrigley Building; in the center, the Chicago Tribune building. Lake Michigan is seen in the upper right-hand corner. In what direction, therefore, are you facing?

If the carcass is to be shipped whole, we find it next being sent to a refrigerating room to be cooled. If it is to be made into hams, bacon, and sausage at the factory, it passes along another line of men, each of whom has his allotted task of cutting and preparing the meat.

We have yet to see what becomes of the parts which cannot be used for meat, such

as the fat, blood, bones, skins, bristles, and hoofs. You will probably be surprised at the number of things that are made from them. The meat packers themselves manufacture some of these waste materials into what are called *by-products*. We shall see enormous vats where soap is being made from fats; great churns where oleomargarine is made from an extract of fat combined with milk and cream; and large kettles where lard is being made. What articles can you name that are made from the hides? Other by-products are fertilizer, bone handles, buttons, glue, oil, grease, candles, and medicines.

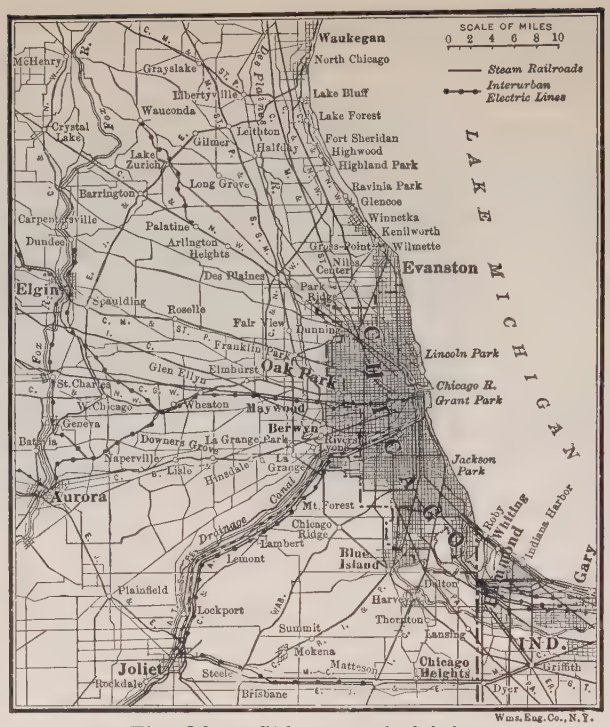


Fig. 86. — Chicago and vicinity

From the discussion in the text sum up all the reasons for the rapid growth of Chicago. The first settlement on the site of Chicago grew up around Fort Dearborn near the mouth of the Chicago River. How many miles long is the Chicago lake front?

The location of Chicago gives it a decided advantage over other cities for iron and steel manufacture. All the important cities of the North Central States are engaged to some extent in the manufacture of machinery or other iron and steel goods; but, as in the case of Pittsburgh, their iron ore must come from the Lake Superior district. Some of the richest iron mines in the world are located northwest of Duluth, about Virginia and Hibbing (Fig. 75), and there are others near Marquette in Michigan on the southern shore of Lake Superior. Also, in the peninsula northwest of Marquette, in the neighborhood of Calumet and Houghton, are very valuable copper mines. These mineral supplies, together with the coal of Pennsylvania, are, as we have seen, the key to the wonderful industrial development of the Northeastern States.

Advantages of the location of Chicago for the metal industry

1. Its nearness to the Lake Superior mineral district

Chicago is almost too distant a market for the important lead and zinc deposits of the North Central and the Southern States, which are mined extensively in Missouri, Arkansas, and Oklahoma (Fig. 153). What are some of the chief uses of these metals?

2. How its location compares with that of Pittsburgh

Chicago is at least as well situated as Pittsburgh for utilizing the mineral deposits of the states bordering on the Great Lakes. Show in Fig. 75 its superiority over Pittsburgh in transportation of ore. How do the two compare in regard to coal supply? The superiority of the location of Chicago for obtaining iron ore is clearly suggested in Fig. 75. Choose some other large city, and compare the advantages of its location for metal manufacturing with that of Chicago. How do they compare in distance from coal? The extent of the industry is suggested by the fact that while Chicago has

3,000 vessels entering or leaving its harbor in a year, the largest item in its freight tonnage consists of iron ore.

3. Its types of steel manufacture

While it makes an enormous quantity of machinery, it is noted for the manufacture of Pullman cars, and turns out more agricultural implements than any other place in the world. The conversion of iron ore into iron and steel takes place mainly at Gary and South Chicago, near the south end of Lake Michigan. Gary has about the same advantages as Chicago and is practically a part of the greater city. It is almost wholly occupied with iron manufacture, and is a leading center for the manufacture of steel for bridges and locomotives.

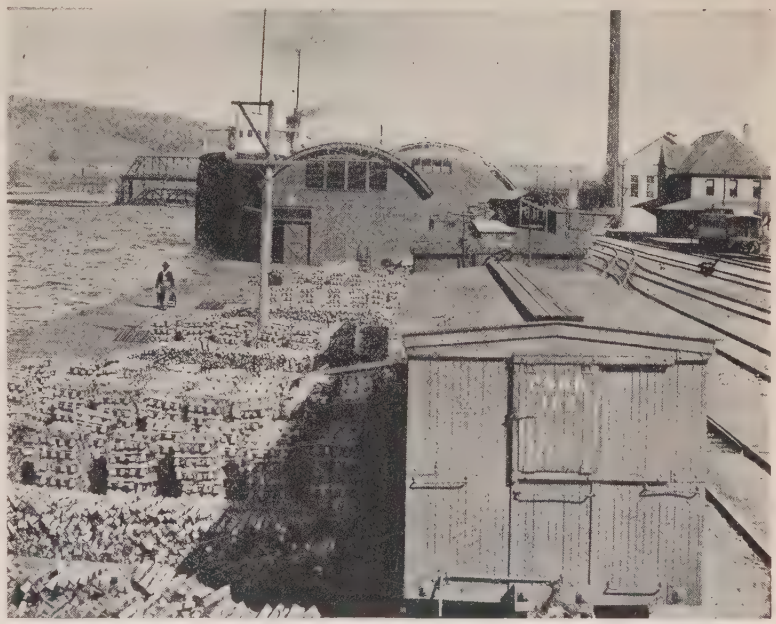
Superiority of its location for general trade

The advantages of Chicago for collecting raw materials for manufacture count just as fully for their distribution in the form of finished products. The agricultural implements of the International Harvester Company are sold in largest quantities in the section of which Chicago is the center, but they are also distributed throughout the world; furniture and other articles made of wood are assembled in Chicago and distributed in all directions; clothing is extensively manufactured there, and sold to merchants in the surrounding states; and many goods from the Northeastern States are likewise distributed from that point. Can you state some reasons why several large mail-order houses have their central offices in Chicago? Finally, the city is the greatest center for lumber in the world.

The chief advantage of the lake cities over the river cities. — The proof that the lake cities have a decided advantage over the river cities is seen in the greater size of the former. Not only does Chicago far surpass St. Louis, the largest river city; but Detroit, Cleveland, and Milwaukee, all lake cities, are the next three in size, and are much larger than Cincinnati, Kansas City, and Minneapolis, which are not lake cities. Note the differences in the population of these two groups of cities (pp. 481 and 484).

Their difference in population

The lake cities have much the same opportunities as the river cities for the han-



© *Detroit Publishing Co.*

Fig. 87. — Copper for shipment, Houghton, Michigan

Houghton is on a deep waterway in the heart of Keweenaw Peninsula. Locate it on Fig. 77. In the picture are shown copper bars piled up like wood. These will be shipped by boat to the lower lake ports and from there on to the great factories in the East. What are some of the uses of copper? Some of the mines in the Houghton region are more than a mile deep. This was once the most important copper region in the United States.

Fig. 88. — The Detroit River

An immense amount of lake shipping passes through the Detroit River. A lake vessel passes the

dling of farm products. Duluth, Superior, and Milwaukee, like Minneapolis, receive great quantities of grain for shipment east; they manufacture flour also. Milwaukee is noted for its meat packing, for its tanneries, and for the manufacture of shoes and many types of metal goods. Detroit is engaged to some extent in the milling of flour and in meat packing, while Cleveland is a market for grain and live stock.

Opportunities common to both

Fig. 75 suggests wherein the chief advantage of the lake cities lies. Tell the story that you see presented in that figure. At what points is the iron ore loaded? Where are the blast furnaces that convert this ore into iron and steel? Describe the routes that the ore must take in order to reach these furnaces.

The ease with which they can secure iron and coal

Pittsburgh, as you have seen (p. 32), is near the edge of the great Appalachian coal field. Since it is near the source of one of the two raw materials required in the manufacture of steel, it can well afford to transport the other from a distance.

Fig. 89. — Milwaukee and vicinity

But trains and steamers that haul ore in one direction can well haul coal in the other. Name several cities on the southern shore of Lake Erie that might, on that account, be expected to engage in iron and steel manufacture. Cleveland, the largest of these, is noted for the manufacture of steel ships, wire, nails, and machinery of many kinds, and the others engage in similar industries. You see that blast furnaces are shown at Duluth (Fig. 75), although there are no coal mines within hundreds of miles to supply the necessary coal. The ore boats returning to Duluth furnish the explanation.

Detroit illustrates to a remarkable degree the effects of this advantage in the manufacture of automobiles. Attempts were made for 200 years to build "horseless carriages," but not until nearly 1900 were any really successful ones produced. With the introduction of the gasoline engine, however, the number of automobiles has increased from a few thousand in 1900 to over twenty-three million in 1926, of which over twenty million were in the United

How this advantage has affected Detroit

© Detroit Publishing Co.

and Detroit

city every ten or fifteen minutes on the average, day and night, during the entire season of navigation.

States. In 1923 nearly 4,000,000 pleasure cars and trucks were turned out in the United States alone.

The center of this industry is Detroit, more automobiles being manufactured there than in any other city in the world. Why is this the case? It is partly because carriage making was formerly carried on extensively in Michigan, Ohio, and Indiana. When the automobile began to displace the carriage, the manufacturers of carriages and wagons turned their attention to the construction of automobiles.

A second advantage that Detroit enjoys which encourages the manufacture of automobiles is the fact that its location on the Great Lakes waterway makes it easy to transport to that point the coal and iron and steel that are required in this industry. Much of the work connected with the manufacture of automobiles consists of the assembling of parts, such as engines, chassis, tires, and bodies made at different factories. Consequently, as large automobile factories have become established, the makers of such parts have built their factories near by so as to have a ready market for their output. By the addition of one factory after another engaged in some phase of automobile construction, Detroit has come to employ as many as 140,000 workmen in these factories alone. Its population increased in the ten years between 1910 and 1920 from 466,000 to 994,000.

© Ewing Galloway

Fig. 90. — Giant hoists unloading an ore boat at Cleveland

Several hoists may work on the same boat at once, each lifting about seven tons of ore at a load, at the rate of a load a minute. With five hoists working on a boat, how long will it take to unload 1,400 tons of ore?

Influence of the Lake Superior minerals on other cities of Indiana and Ohio. — In almost any section of Indiana and Ohio one sees corn, oats, cattle, and hogs on the farms; and the same industries that are found in the towns and cities of Iowa and Kansas are common here. There are others, also, owing to the ease with which iron ore can be obtained from the Lake Superior district. For instance, Indianapolis is on no important water system, but owes its growth in large part to the prosperous farm lands about it. It is a center for grain, live stock, and meat. In addition, it ranks high in the manufacture of automobiles. Columbus, Ohio, is a grain center, but is also noted for the manufacture of machinery, steel cars, and other objects made of metal. Again, Cincinnati handles large quantities of live stock and meat products; but its leading industry is the manufacture of machinery and implements of many kinds for use in the mines, in the factories, and on the farms. In general, the nearer the cities are to the coal beds in eastern Ohio and Illinois and to the routes between these coal beds and the lake ports, the more prominent is their work in iron and steel.

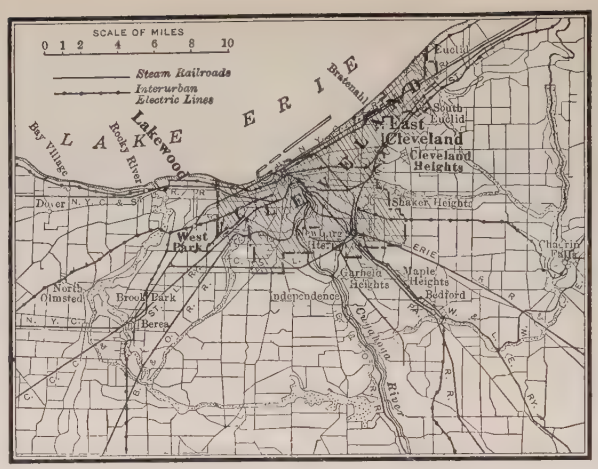


Fig. 91. — Cleveland and vicinity

Notice the elaborate system of parks and boulevards indicated by dotted areas.

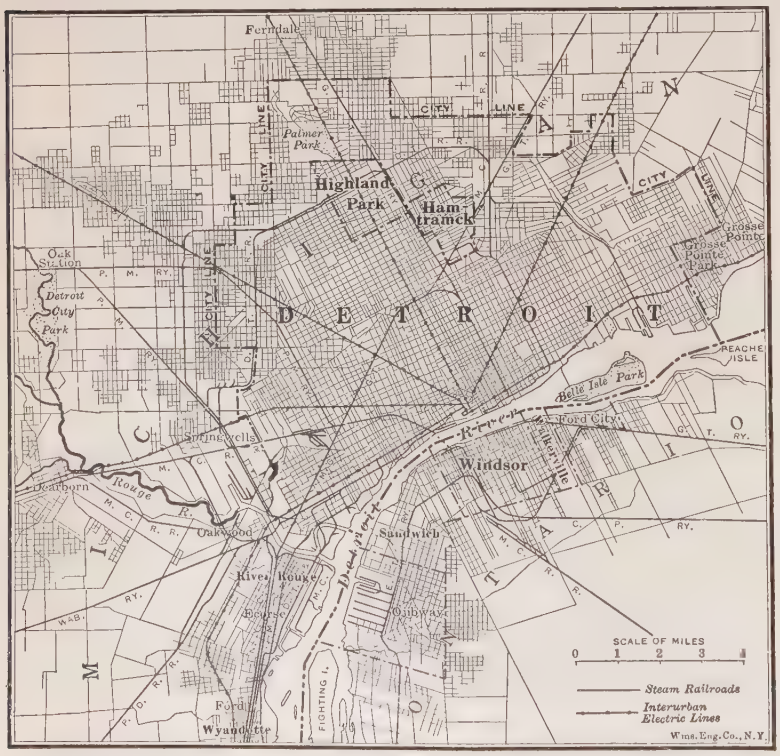
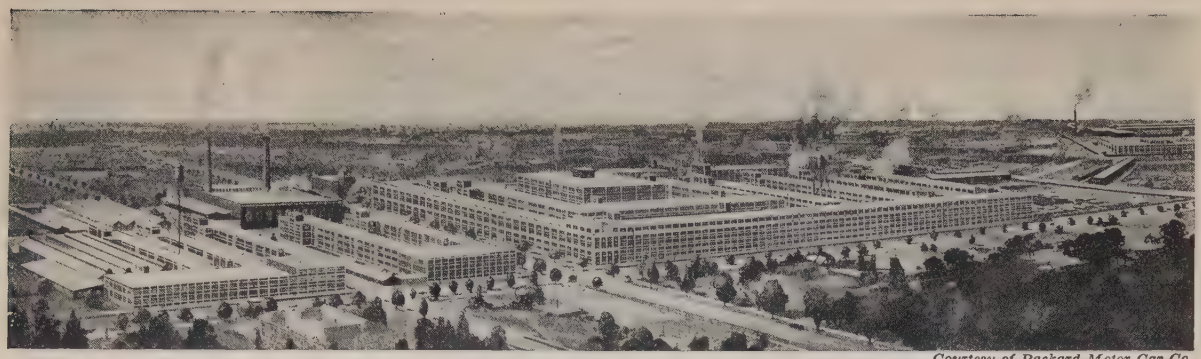


Fig. 92. — Detroit and vicinity

Highland Park and Hamtramck are separate cities, entirely surrounded by Detroit.

How one industry leads to another. — The farmer is employed in raising wheat; the wheat must be transported to flour mills, where it is made into flour; the flour, in turn, is transported and is then used for the baking of bread, pies, cakes, etc. Again, the mining of iron ore leads to its trans-

Examples of the dependence of one industry upon another



Courtesy of Packard Motor Car Co.

Fig. 93. — The Packard Motor Car Company's factory at Detroit

portation on the lakes; that leads to the manufacture of iron and steel; the steel, in turn, is used in making many parts of automobiles; and these require rubber tires. Thus one important raw material starts a long series of industries. As a rule, no man works alone; he is dependent upon the work of others who precede him; and others are dependent upon him. Any one who does careless work or suddenly refuses to work threatens the prosperity of many persons whom he has never seen.

Rubber furnishes a splendid example of the growth of the present industry, and of the effect of one product upon many others.

The remarkable example of rubber

1. The history of the industry

In the eighteenth century some Europeans found that the milk of certain tropical trees could be formed into a substance which would rub out pencil marks; the name *rubber* was therefore given to it. In the beginning of the nineteenth century a Scotchman applied this milk to cloth to make it waterproof, but in hot weather it melted and became sticky and in cold weather it cracked. In 1842 an American named Goodyear discovered that by mixing sulphur with the rubber — a process called *vulcanizing* — these faults could be remedied. Soon the manufacture of waterproof clothing, boots, and shoes became a large industry. Indeed, the value of rubber boots and shoes made in the United States at present is about one tenth that of those made from leather. By using

© Ewing Galloway

Fig. 94. Indianapolis

In the background is the Soldiers and Sailors Monument; this is in the heart of the city in the district known as the *Circle*.

a large percentage of sulphur it was found that hard rubber, such as that used in combs and fountain pens, could be produced.

2. Its present extent

There are now over 200,000 persons employed in manufacturing rubber articles in the United States. Most of our rubber boots and shoes are made in New England, but over one third of our manufactured rubber comes from in and around Akron, Ohio, which, like Detroit, grew enormously in the ten years preceding the census of 1920. That city is particularly noted for automobile tires. Why should such manufacturing be done in Ohio? About three fourths of our rubber is made into tires. If the United States uses three fourths of all the rubber produced in the world, what proportion of the whole do we consume for tires?

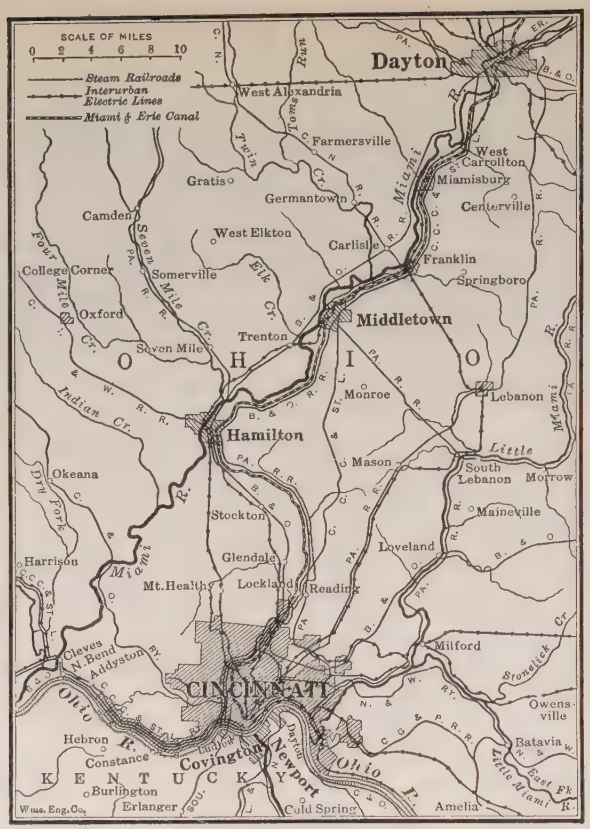


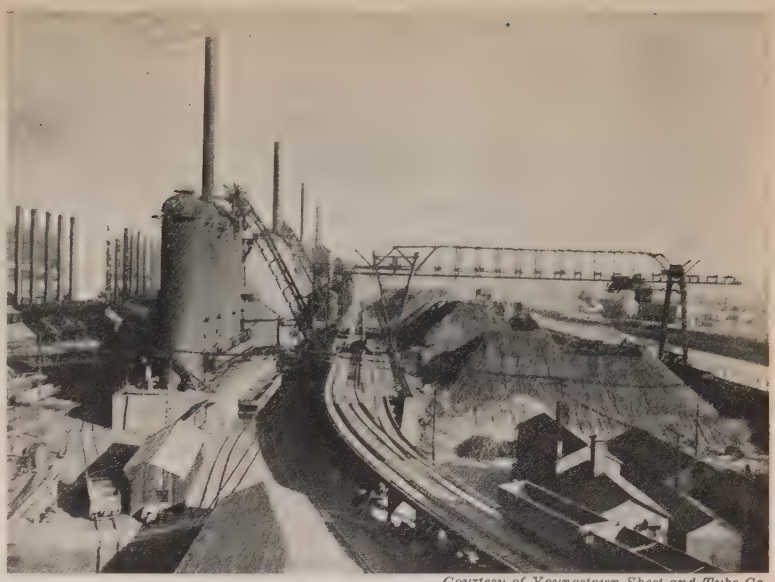
Fig. 95. — Cincinnati and vicinity

The variety of uses to which rubber has been put is one of the most remarkable of modern developments. Name some rubber articles used in electrical work; on bicycles; in gardening; in clothing; in football; in baseball; in the schoolroom. What rubber articles have you seen in drug-store windows? What hard-rubber articles can you name? Some of the things you probably will not think of are rubber

Fig. 96. — A portion of Cincinnati

Cincinnati is built on a high bank at the outer portion of a bend in the Ohio River (Fig. 95). In its early history its

packing used in engines, pumps, and valves; rubber belts on machinery; and rubber hose in the air-braking systems of trains. In all there are over 30,000 different articles made of rubber in the United States, requiring about six and one half pounds of rubber per person each year. All this rubber must be imported. How many tons do we require?



Courtesy of Youngstown Sheet and Tube Co.

Fig. 97. — Blast furnaces at Youngstown, Ohio

The eastern part of Ohio is well located for the manufacture of pig iron and steel. Locate Youngstown on Fig. 77. Where does the coal come from? The iron ore? What other cities in the North Central States are engaged in iron and steel manufacture? How do their advantages compare with those of Youngstown?

The vital importance of the Great Lakes. — Although the Great Lakes have frequently been mentioned in this text, they are of even greater importance than has been indicated. They are the greatest system of fresh water lakes in the world, and their area is so extensive that they have an appreciable effect upon the climate of the land about them. The fruit regions south of Lakes Erie and Ontario and east of Lake Michigan are proofs of this statement. Recall the facts you have learned about the influence of the lakes on fruit growing (p. 56).

Yet it is as a water route that the Great Lakes are of greatest importance. Forming our northern boundary — with the exception of one lake — they might be supposed to be

Courtesy of Cincinnati Chamber of Commerce

with the Ohio River in the foreground

growth was greatly aided by the commerce on the Ohio. What other factors can you name that have favored its growth?

Courtesy of The Goodyear Tire and Rubber Co.

Fig. 98. — A tire factory at Akron

The rubber used here comes chiefly from Sumatra and Brazil. Locate Sumatra on Fig. 400. Much of the cotton used in these factories is raised in Arizona (p. 141).

too far from the centers of industry to figure prominently in transportation. Nevertheless, they are worthy of comparison with our most important railroad systems.

Eight of our states, containing two fifths of the population of our whole country, border upon them. Name the eight. The region tributary to the lakes is the richest part of the continent in both farm products and minerals. In addition, the original forests, especially on the Canadian side (p. 35), were of enormous extent and value and are still extensive in Canada. The fact that grain, iron ore, lumber, and coal are especially bulky, and therefore very expensive to transport by rail, is what gives the lakes their special significance as a waterway (p. 76). Without the cheap transportation that they provide, it is doubtful whether the ores in the Lake Superior district would have been exploited; and without them the industrial development of both the Northeastern and the North Central States would be only a small part of what it has become.

As it is, one sixth of the tonnage in the United States merchant marine is found on these lakes; and during recent years twelve times as much freight has annually passed

© Ste. Marie Chamber of Commerce

Fig. 99. — The four locks at the American Soo (Sault Ste. Marie)

Locate this city and canal. On the extreme right and extreme left the gates of the locks are closed. To the left of the center two lake freighters are steaming into the lock to be "locked up," and to the right a large boat is just coming out of the lock. Why are so many locks needed? What do you think the "up-bound" boats are carrying? The "down-bound" boats?

through the Detroit River as through the Panama Canal. With the increase of farm products in the North Central States and in the adjoining section of Canada, the quantity of this traffic is likely to become even greater.

How difficulties in transportation on the Great Lakes have been met. — Great difficulties have had to be overcome in providing this convenient and cheap transportation. For instance, the lakes are on different levels. Fig. 77 shows how greatly they vary in elevation. How much lower is Lake Huron than Lake Superior? What is the descent from Lake Huron to Lake Erie? How much lower is Lake Ontario than Lake Superior? The greatest descent is that from Lake Erie to Lake Ontario, which is 327 feet. The Welland Canal, therefore, which connects these two, has a large number of locks. Locate it. Locate other canals that have been necessary and state the approximate number of feet that vessels must be raised or lowered at such points. The largest lake boats now in use are over 600 feet long, carry 10,000 to 16,000 tons of cargo, and draw seventeen or eighteen feet of water. It has been very difficult and expensive to build canals and locks that could accommodate such vessels, though the largest ocean vessels draw more than thirty feet of water. In order that the boats may carry the largest possible cargo with the shallow draft to which they are limited, they are made with flat bottoms and blunt at bow and stern.

The difficulty due to the different levels of the lakes, and how this is overcome

The time consumed in loading and unloading the boats used to be a serious handicap; but the speed with which iron, coal, and grain are now handled is one of the remarkable accomplishments in the lake transportation. It is not equaled anywhere else in the world. Partly on that account, cargo boats can now make the trip from Duluth to Buffalo and back again within ten days. What reasons do you see for such haste, when freight so imperishable as ore and coal is carried?

Other difficulties, and the extent to which they have been overcome

There are two difficulties that are not yet properly surmounted. One is the lack of freight for the westward trip. Why should there be this difficulty? Do you see any possible remedy in the future?

Courtesy of Crosby-Chicago Adv. Agency

Fig. 100. — Hauling logs by sled, North Central States

The snow and ice of the northern part of the United States make the transportation of logs easy. Very large loads are hauled on a single sled on roads that have been sprinkled to make them icy. These logs are oak and maple. What will the lumber be used for in the factories of Grand Rapids, Chicago, and elsewhere?

The other is far more serious. This wonderful waterway is open only about 220 days on the average per year. What per cent of the time is that? The rest of the year ice, or the danger of ice, closes navigation almost entirely. What must be some of the effects of this obstacle?

The demand for lumber in these states, and how it is met. — The demand for hard woods, such as hickory, oak, walnut, and ash, is much greater in the North

Extent of the demand

Central States than in the Northeastern group. The fact that leading furniture stores in New York City deal largely in furniture from Grand Rapids, Michigan, suggests how extensively furniture for the East comes from this quarter. The manufacture of farm implements — wagons, plows, corn planters, mowers, binders, reapers, threshers, and scores of other articles used on the farm — calls for additional quantities of hard wood. Since the supply of farm implements for a large part of the world comes from these states, this demand is especially large.

Courtesy of Crosby-Chicago Adv. Agency

Fig. 101. — A Wisconsin sawmill with its log pond

There are still many sawmills in the northern parts of Michigan, Wisconsin, and Minnesota, but the Great Lakes region, once the greatest lumber region of the country, now produces only a small part of our lumber. On the left in the picture is a pile of logs that have been unloaded from railroad cars. When a region is first lumbered the logs are usually floated to the mills on the rivers, but later railroads are built for the logs cut from the more distant parts of the forest.

Less soft wood for paper pulp is needed in the North Central than in the Northeastern States; for, in proportion to the population, much more printing is done in the latter (p. 35). Nevertheless, the consumption of pulp wood is very large; and the amount of lumber required for building is tremendous.

How the demand is met

The northern parts of Michigan, Wisconsin, and Minnesota were formerly covered with coniferous forests, and were at one time the leading source of pine lumber in the United States. This accounts for the establishment of important pine furniture factories in Grand Rapids. In recent decades, however, the supply in this region has rapidly decreased.

In considering other sources of supply, it should be remembered that from Illinois westward most of the land is either prairie or Great Plains, where there are scarcely any woods except along streams. What makes the lack of wood still more serious in much of this area is that there is little stone available for building, such as one finds in the East.

The lumber used in the North Central States comes from a variety of sources. In Figs. 147 and 188 note the leadership of the South and the West in lumber production. The vast forests in Canada, north of the Great Lakes, are also an important source of supply.

The great cities in these states are practically all important lumber centers, Chicago being especially important in this respect, as before stated, and Duluth being prominent also. Yet it is plain that they are only centers for collecting and distributing, for much of their lumber has been hauled hundreds of miles.

The scarcity of timber is leading to the use of numerous substitutes. In many localities the clay can be made into excellent

bricks, which are now used in enormous quantities. For construction of buildings in cities they are often preferred to lumber. Can you suggest why? Concrete has come into very extensive use. Metal laths are rapidly taking the place of the old style wooden laths, and composition shingles that will not easily burn are also becoming common.

Increasing use of substitutes

Facts to be especially well fixed. — 1. Location of the principal lake cities. 2. Of the principal river cities and other cities not on water routes. 3. Of the coal beds. 4. Of the iron and copper mines about Lake Superior. 5. Main transportation routes by water (show by a drawing). 6. List of farm products in which this section leads. 7. Location of leading wheat regions. 8. Of the Corn Belt. 9. List of leading manufactures.

Problems for independent study. — 1. See how long a list you can make of the uses of corn. Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 131–134 (Ginn); Robinson, E.: *Commercial Geography*, p. 89 and Fig. 45 (Rand McNally). 2. Make a list of common breakfast foods, and try to find where they are manufactured. 3. How has the material used in building fences changed in the last forty years? 4. Write a letter describing the change in farm scenes as one passes in late June from Cincinnati to the northwestern part of North Dakota. 5. Lake Erie extends about as far south as Lake Michigan. Why is not Toledo as great a city as Chicago? Adams, C. C.: *A Textbook of Commercial Geography*, pp. 152–153 (Appleton); Smith, J. R.: *Commerce and Industry*, pp. 290–291 (Henry Holt); Robinson, E.: *Commercial Geography*, pp. 167–168 (Rand McNally); Hotchkiss, C. W.: *Representative Cities of the United States* (Houghton Mifflin); Tarr, R. S., and von Engeln, O. D.: *New Physical Geography*, revised edition, pp. 500–501 (Macmillan). 6. The rivers in these states are much less used than the Great Lakes. How do you account for this? Journal of Geography, 1918, vol. 16, pp. 201–210; Adams, C. C.: *A Textbook of Commercial Geography*, pp. 149–153. 7. Corn produces fat in hogs, so that corn-fed hogs are lard hogs. Skimmed milk, together with rye, clover, and barley, produces lean hogs, especially good for bacon. Where would you expect to find most lard hogs raised? Most bacon hogs? 8. Write a composition on the prospects for the growth of Superior and Duluth. See especially World Book, vol. 3, p. 1877; consult also Journal of Geography, 1916, vol. 14, pp. 193, 230–233; Hotchkiss, C. W.: *Representative Cities of the United States;* McMurry, C. A.: *Type Studies from the Geography of the United States*, pp. 163–174 (Macmillan). 9. Ocean vessels of moderate size can reach Chicago and Duluth. Trace the route they would have to take. 10. Trace the route of iron ore from the Mesabi Range to Pittsburgh, telling (1) the means of transportation throughout the trip; (2) the

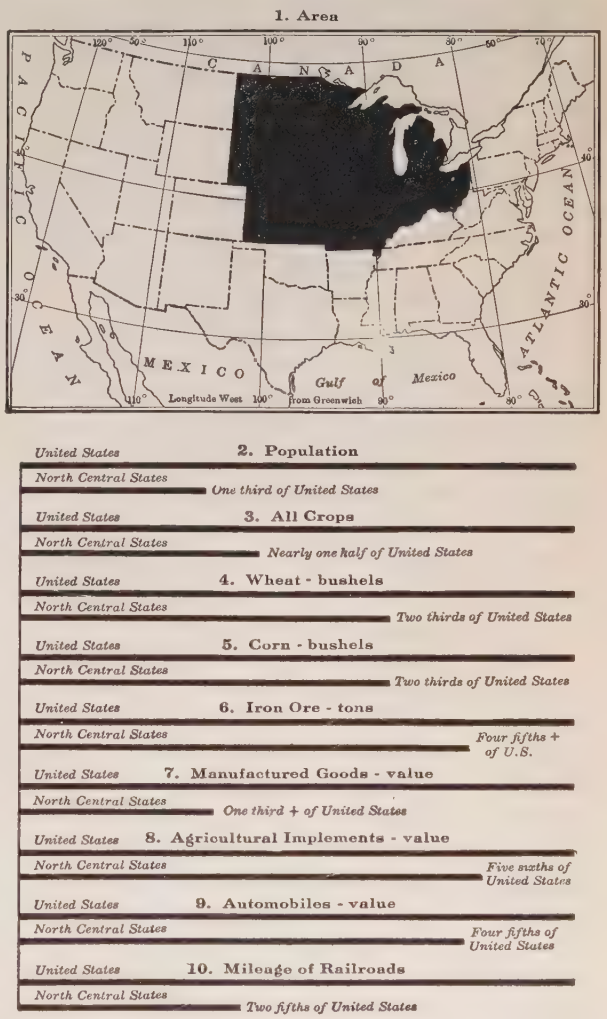


Fig. 102.—The North Central States in comparison with the entire United States (1920)

points where it is transferred from ship to railroad car or the reverse; and (3) the large cities passed. Hotchkiss, C. W.: *Representative Cities of the United States*, pp. 80–82, 123–125; McMurry, C. A.: *Larger Types of American Geography*, pp. 135–136 (Macmillan). 11. What other materials besides wheat are used for bread? Why is wheat preferred to all these? Farmer, F. M.: *Boston Cooking School Cook Book*, p. 46; Bengtson, N. A., and Griffith, D.: *The Wheat Industry*, pp. 167–190 (Macmillan). 12. Visit a brickyard and describe the process of brickmaking. 13. What have been the causes of recent lowering of the lakes? 14. Find out how the lake boats are loaded and unloaded. 15. What makes of automobiles do you recognize? Locate on the map the city where each of these is made. 16. With what makes of automobile tires are you acquainted? In what cities are these made? 17. In what cities in the North Central States are watches made in large numbers? 18. In the advertising section of a leading magazine, classify the articles that are advertised as manufactured in the North Central States under the following heads: (1) food products; (2) clothing; (3) building materials; (4) home furnishings; (5) office fixtures; (6) miscellaneous.

How you can find needed articles in magazines. — The *Reader's Guide to Periodical Literature* is a record of all the articles that have been published in current magazines, grouped in books and arranged by years. For example, all articles which appeared in magazines during the year 1917 are grouped under certain headings. These are arranged in a book alphabetically and the exact reference given to the magazine in which the article may be found. This is an important help, for you can well realize that it would otherwise be difficult to find an article that appeared several years ago, even if you had all the magazines before you.

Let us suppose that you want data to debate this question: *Resolved*, that the treatment of the Indians by the United States Government has been wise. — You will take a *Reader's Guide* of a comparatively recent year, since you want up-to-date material. Let us choose the *Guide* for 1915–18. Turn to the letter "I," for we are going to look under "Indians." When we have found it, we see that a great many items are given, such as Diseases, Dwellings, Education, Folk lore . . . Government relations. The last is the one we want, and this is the way in which the references to the magazines are quoted:

From the War Path to the Plow — F. K. Lane. il Nat. Geog. M. 27: 72–87 Ja. '15.

"il" indicates that the article is illustrated. If pictures are lacking, "il" is omitted. The second line signifies that the article by that name and author will be found in the 27th volume of the National Geographic Magazine on pages 72–87, or, if the numbers have not yet been bound, in the number for January, 1915.

3. The Southern States

State	Area in Square Miles	Population (1920)	Largest City	Population (1920)
Alabama	52,000	2,348,000	Birmingham	178,000
Arkansas	53,300	1,752,000	Little Rock	65,000
Florida	58,700	968,000	Jacksonville	92,000
Georgia	59,300	2,896,000	Atlanta	201,000
Kentucky	40,600	2,417,000	Louisville	235,000
Louisiana	48,500	1,799,000	New Orleans	387,000
Mississippi	46,900	1,791,000	Meridian	23,000
North Carolina	52,400	2,559,000	Winston-Salem	48,000
Oklahoma	70,000	2,028,000	Oklahoma City	91,000
South Carolina	31,000	1,684,000	Charleston	68,000
Tennessee	42,000	2,338,000	Memphis	162,000
Texas	265,900	4,663,000	San Antonio	161,000
Virginia	42,600	2,309,000	Richmond	172,000
West Virginia	24,200	1,464,000	Wheeling	56,000

Questions. — 1. Which state far outranks all the others in area? Find out from your textbook in history how so large an area of land happened to become a single state in our Union. 2. Compare the largest cities in size with the largest cities in the states that you have previously studied.

Density of population of these states as compared with that of the North. — Fig. 103 shows the density of population in the Southern States. The people are somewhat evenly distributed over the territory with the exception of two districts, one in the southeast and the other in the west. Name the two states that have large areas very sparsely settled.

In this entire group of states, which is nearly as large as the Northeastern and North Central States, there are only three cities of over 200,000 population. Note their names and populations (p. 94). If you compare the North and the South in density of population as shown in Figs. 21, 62, and 103, you will see what a striking difference there is in the number of large cities. (For the sake of brevity, we use the term *North* to mean the Northeastern and North Central States combined.) Out of the twenty-five largest in the United States, only one, New Orleans, is in the South. How do the Southern States compare in area and population with the North Central States (p. 62)? From these facts, what occupation may be expected to be most prominent in the South?

Fig. 103. — Distribution of population in the Southern States

Each dot represents 10,000 people.

Extent to which the South raises the same farm products as the North. — If you turn to Fig. 70, you may be surprised to find

© Detroit Publishing Co.

Fig. 104. — A cattle ranch in western Texas

Great numbers of cattle and horses are raised in western Texas. Formerly the cattle were herded on open ranges on public land. Now most of this land has been purchased by cattlemen and fenced in with barbed wire. Some portions are devoted to dry farming; dry-farm crops (p. 144) are raised for feed during the winters. Rivers are few in this region and the cattle often come long distances to a water hole or a stream.

how much corn is raised in these states. While the Corn Belt is in the North, there is only one Southern state that does not produce considerable quantities of that grain. Which one is it? Which Southern state seems to have the greatest proportion of its land in corn? Note that a large amount is raised even in the Appalachian Highland.

Extent to which it approaches the North in grain and live stock

Oats are not so evenly distributed as corn, yet this crop is raised in every state.

In view of the large amount of corn, one might expect to find many hogs. Fig. 230 shows how large the number actually is. Outside the Corn Belt, the Southern States lead in their production. Nor is this section very far behind in cattle, as can be seen in Fig. 73. Texas, especially, is noted for beef cattle. Even the arid western part of that state raises a large number, the natural grass of the Great Plains being supplemented by cottonseed cake and by alfalfa, kafir corn, and other fodders. There are, however, only about two fifths as many dairy cattle in the South as in the North. The lack of great cities partly accounts for this.

Fig. 64 shows that considerable wheat is grown in Oklahoma and northern and central Texas. In fact most of the southern farms raise some wheat each year for home use, and nearly every large town has a flour mill, where the neighboring farmers take their corn or wheat.

Apples are grown for market in the cooler portions of the South. They are exten-

sively grown in the Appalachian Highland. Some of the finest apples come from Virginia. More peaches are raised in the Southern States than in any other section of the United States except California. The famous Georgia peaches appear in the Northern market each year long before those of New Jersey and Michigan are ripe.

Extent to which the same fruits and vegetables are raised

The common vegetables of the North are also grown in the South. It is the South that keeps the markets of the Northern cities supplied with lettuce, radishes, string beans, and new potatoes through the winter and early spring. It far surpasses the North, also, in the production of sweet potatoes; though New Jersey grows them extensively, nine tenths of our supply comes from the South.

1921 Yearbook of the Department of Agriculture

Fig. 105. — Tobacco acreage, 1919

Name the leading tobacco-growing sections, by states. Is tobacco a Northern or a Southern crop?

There are four Northern states in which tobacco is a prominent crop. Find which these are from Fig. 105. Yet the same figure shows that the South produces most of the tobacco raised in the United States. In fact, more than four fifths of it is grown there. Name the states that lead in its cultivation.

Superiority of the South over the North in production of tobacco

There are two principal tobacco regions. In parts of Tennessee and Kentucky the well-known Burley tobacco is grown. In these states the tobacco may be *air-cured* by being exposed to the air in open sheds and barns or *fire-cured* by heat and smoke. A common sight during the early fall in some parts of these states is that of tobacco barns with smoke issuing from the cracks and crevices. The heat and smoke are produced by burning wood and sawdust on the earthen floors beneath the tobacco hung loose from racks. In North Carolina and Virginia the tobacco is generally *flue-cured*. The hot air and smoke from a flue furnace pass through pipes or flues in the barns. Heat does the curing.

© *H. P. Cook*

Fig. 106. — A field of tobacco

The tobacco plant has a stout stalk from which grow large, thin leaves, which constitute the valuable part of the plant. About how high are the plants in this field? The young tobacco plants are delicate and are usually protected by large awnings of canvas, and later transplanted into the open fields.

Practically all the farm products of the North are grown also in the South, some of them in large amounts and a few of them even more extensively than in the North. In general, however, it is behind the North in the quantity of such products.

Possibility that the South will closely compete with the North in these crops. — If the South can grow all these things, why should it not produce larger quantities? Why, in short, should it not compete closely with the North in Northern crops? The South enjoys many peculiar advantages for such production. In much of Florida gardening can be carried on the whole winter through; and in sections a little farther north two or three different crops can be raised in one year. For example, Irish potatoes are planted early enough to be up soon after the last killing frost and are later harvested as "new potatoes." Quickly the same ground is planted in corn. Then, before this has grown to any great height, soy beans may be planted between the rows; or on other farms corn may be followed in the late fall by winter wheat or oats or rye.

© Gilliams Service

Fig. 107. — A truck garden in the northern part of Florida

Beans are being packed in baskets to be sent to the markets of New York, Philadelphia, and other cities. In this part of Florida garden truck is ready for the market in early March, long before the gardeners in the North are beginning to plant. On light, sandy soil like that of the Coastal Plain the plants grow much more rapidly than on heavier soil.

Peculiar advantages of the South for such production

The Northern farmer has much fear of a late frost in spring or of an early one in the fall; but the long growing season in these states relieves the farmer who is growing only one Northern product from such danger. Besides, not being hurried to get in his crop for fear of frost in the fall, he can do most or all of his work himself and thus avoid employing extra help at high cost.

In the North all root crops must be dug in the fall and stored in cellars or other well-protected places. In the South the storage of such crops for the winter is a much simpler matter. As far north as Tennessee, except at high elevations, root crops may be left in the ground if covered with two or three inches of dirt. The ground here rarely freezes more than an inch or two below the surface during the winter.

Finally, with grass and other green fodder growing seven or eight months in the year, so that there need be no long feeding season under shelter, and with the winters so mild that warm stables are not necessary, some of the worst difficulties in the raising of live stock in the North are avoided.

Nevertheless, the farmers of the South encounter some difficulties, as do farmers in

other parts of our country, particularly in the growing of crops that seem better adapted to other climates.

Disadvantages of the Southern climate for Northern products

Corn, so prominent a crop in the Corn Belt of the North Central States, is grown all over the South, as stated on page 96. The hot, moist weather, with hot nights, so common over many of the Southern states, offers, as in the Corn Belt, excellent growing conditions. However, the average yield per acre is less than in the corn states. There are several reasons for this lower yield. One is that corn, in most parts of the South, is not considered the most important crop; hence its yield is not as great as it would be if more attention were given to its cultivation. In the North or in the South, a yield of one hundred bushels to the acre is high. It is interesting to know that many Corn Club boys in various parts of the South produce annually as much as two hundred bushels per acre. What does this fact indicate?

Simplified from The Geography of the World's Agriculture

Fig. 108.— The average number of frostless days in the United States

This map indicates roughly the length of the growing season. What portion of the United States has never experienced a killing frost? How does the length of the growing season along our northern compare with that along our southern boundary? Why do the areas of few frostless days extend so far south in the Western States? (Fig. 17 gives a clue to the answer.)

We have all noticed, no doubt, that certain grasses grow best in cool, moist weather. This is true of blue grass, timothy, and other nutritious varieties that are much used for feed. In many parts of the South the summers are too warm for the growing of such grasses. But legumes, such as peanuts and velvet beans, are well adapted to the climate. These furnish excellent feed for live stock and are good crops for enriching the soil.

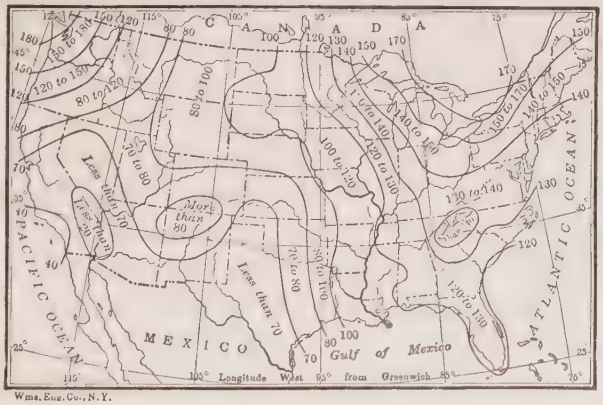


Fig. 109. — Number of days in the year during which some rain falls

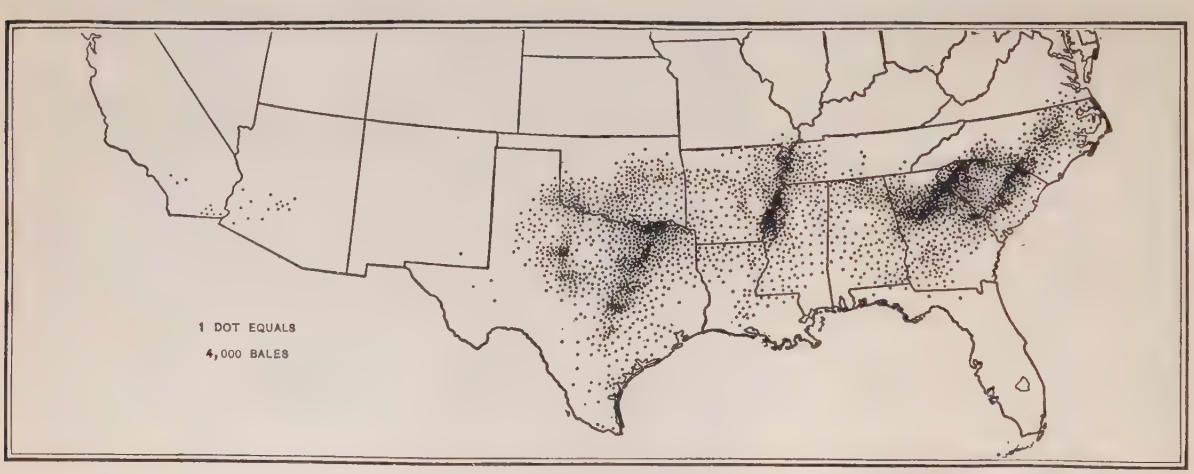
Though the raising of live stock in the South has never been a leading industry, some sections of most Southern states, particularly Tennessee, Kentucky, and Texas, are raising fine cattle in considerable numbers; and one world's prize-winning Hereford came from Mississippi.

Oats are a cool weather crop. Nevertheless, they are grown successfully in the South. Oats are

generally planted in the fall; they are often used for grazing during the winter; and they are harvested in late spring.

Many of the disadvantages from which the South has suffered are being overcome. For example, the light soils of the Coastal Plain have been found to be especially suited to the growing of garden crops, pecans, and certain fruits and berries — Satsuma oranges and strawberries in particular. Dairying, too, is increasing in all parts of the South. Nevertheless, the South will probably never approach the North Central States in the production of grain and live stock; it is not at its best in these types of farm activities. On the other hand, it has its own types in which it already holds first rank, and in which the North would have no chance whatever if it should attempt to compete. Let us see what some of these are. The greatest crop peculiar to the South is cotton. How does it compare with corn in importance?

How cotton compares with corn in importance. — Corn is by far the most important crop in the United States, being one of the leading sources of food for men and animals. There is a saying that our corn is made into "hog, hominy, and hoecake." Yet very little is directly consumed by man; most of it is fed to cattle and hogs, and eaten in the form of beef and pork. It takes from ten to twelve pounds of corn to make one pound of beef, and from five to six pounds to make one pound of pork. Since the United States exports vast quantities of meat, it is evident that foreign countries also are greatly dependent upon our corn for food.



From The Fourteenth Census of the U. S.

Fig. 110. — Cotton production, 1919

Name the more important cotton-producing states. From Fig. 123 find out which land regions in the South are best adapted to the raising of cotton. What ports would naturally serve as the shipping points for the cotton of each of these states? Why does the Cotton Belt not extend farther west in Texas? (See p. 101.)

Cotton and wheat in the United States rank next in value to corn; in some years the value of wheat exceeds that of cotton, and in other years the reverse is true. Cotton is thus the second or third great American crop, as valuable in providing clothing as corn and wheat are in providing food. The principal materials that compete with it are wool, silk, and flax, but it far outranks all three together. It is almost the sole material for clothing in tropical countries, and is taking the place of these others more and more in the temperate regions.

Our country on the average produces about seventy per cent of the world's corn and approximately one half of its cotton. Cotton manufacture is one of the leading industries in New England, which obtains the raw material chiefly from the South. It is one of the leading industries of Great Britain also, and of France and Belgium and other European countries and Japan as well; all these countries depend mainly upon our Southern States for their cotton. Thus many parts of the world look to America for material for clothing as well as for food.

Why the South has so nearly a monopoly of cotton. — If cotton is the principal material throughout the world for so necessary a thing as clothing, why do not other countries produce more of it? At present there are only two others — India and Egypt — that are prominent in its cultivation; and India grows only twenty-three per cent of the world's supply, while Egypt is limited to six per cent. Why has the South so nearly a monopoly?

How the climate favors cotton

There are several reasons. First of all, it has a climate over a wide area that is peculiarly adapted to cotton. That plant requires about seven months free from frost, and produces most cotton when the rainfall is moderate. Fig. 108 shows the area that has not less than 200 days per year without frost. Estimate its length east and west. The areas in the United States where cotton is produced are shown in Fig. 110. If you recall the fact that the altitude of the Great Plains in Texas increases toward the west, you can understand why there is too much frost for cotton in western Texas. Can you, then, explain why parts of Tennessee and western North Carolina are not included in the Cotton Belt? In addition to the states of this section, two of the Western States are growing increasing quantities of cotton. See Fig. 110 and p. 141.

Fig. 18 shows the rainfall in the United States. What does it tell you about the amount of rain in the Cotton Belt? The season when the rain comes is important, as well as its quantity. The fields must be plowed and planted in April and May, when it is fairly dry. In midsummer, when the plants are growing, showers are more abundant, which is very desirable. In the fall, when the growth of the stem needs to be checked, so that the cotton can develop, there is less rain; and the same is true later, when the

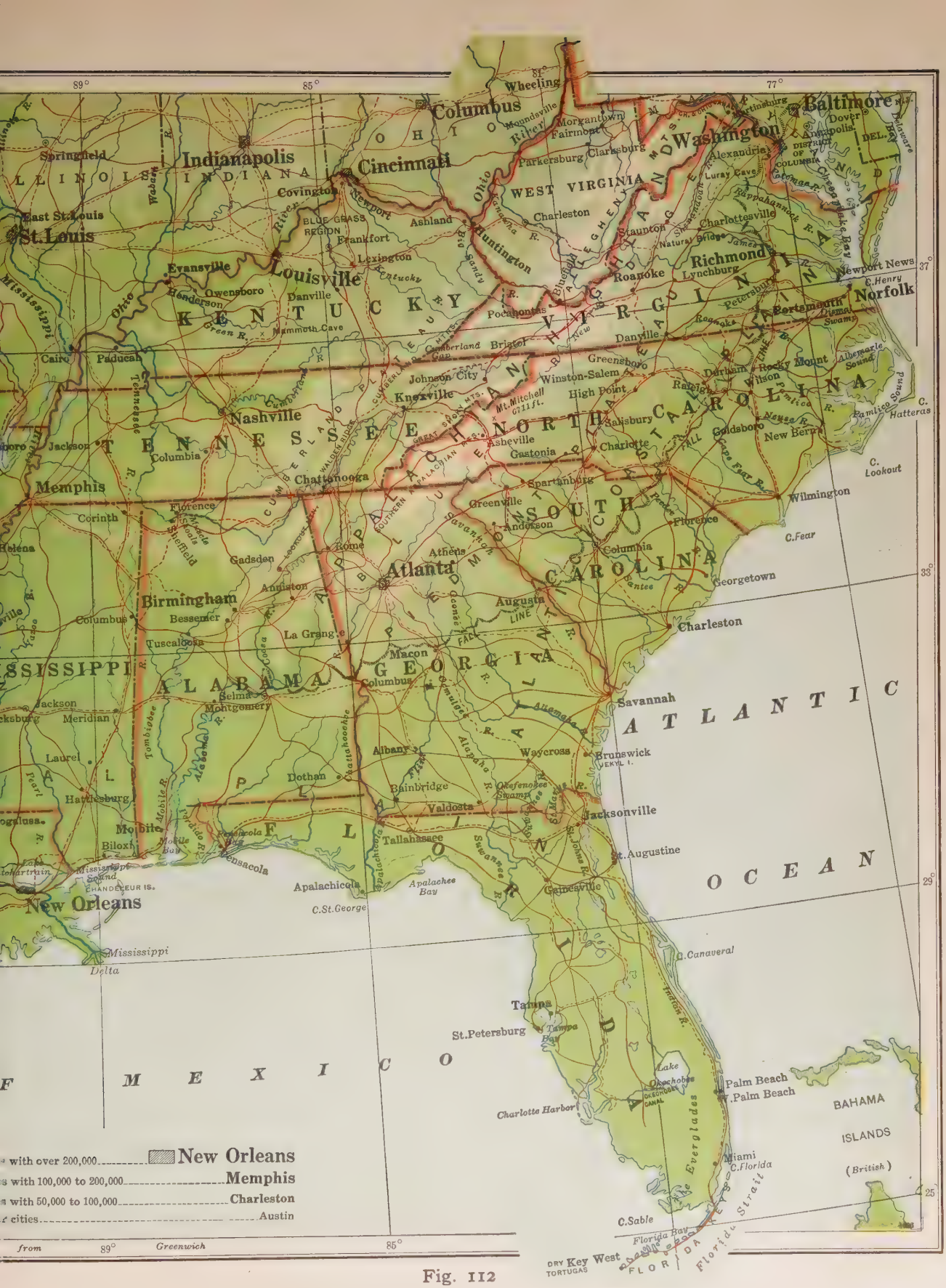
© H. P. Cook

Fig. 111. — Picking cotton

The picking of the cotton crop, here done by negro men, women, and children, is the most expensive operation connected with cotton growing. Several pickings are required for each harvest. Cotton-picking machines are now being introduced with some success.

SOUTHERN STATES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 25 50 100 150 200
National capital
State capitals
Canals
Important highways
Railroads
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
WILLIAMS ENGRAVING CO., N.Y.
105°
101°
97°
93°
37°
33°
29°
25°
Longitude
West
NEBRASKA
COLORADO
KANSAS
MISSOURI
OKLAHOMA
ARKANSAS
LOUISIANA
TEXAS
NEW MEXICO
MEXICO
GULF
ROCKY MOUNTAINS
GREAT PLAINS
OZARK PLATEAU
Kansas City
Topeka
Wichita
Colorado Springs
Pueblo
Santa Fe
Amarillo
Oklahoma City
Tulsa
Fayetteville
Fort Smith
Little Rock
Hot Springs
Pine Bluff
Texarkana
Shreveport
Ruston
Monroe
Natchitoches
Alexandria
Baton Rouge
Lake Charles
Beaumont
Port Arthur
La Fayette
Houston
Galveston
Galveston Bay
Atchafalaya Bay
Dallas
Fort Worth
Denison
Sherman
Paris
Greenville
Wichita Falls
Lawton
Ardmore
Chickasha
Enid
Guthrie
Bartlesville
Muskogee
Sapulpa
Okmulgee
Shawnee
McAlester
Jefferson City
Abilene
Sweetwater
Ranger
Cleburne
Tyler
Marshall
Corsicana
Waco
Palestine
Temple
Austin
San Angelo
El Paso
Del Rio
San Antonio
Laredo
Corpus Christi
Corpus Christi Bay
Matagorda Bay
Brownsville
Matamoros
Rio Grande
Red R.
Arkansas R.
Canadian R.
Cimarron R.
Pecos R.
Colorado R.
Brazos R.
Trinity R.
Neches R.
Sabine R.
Ouachita R.
White R.
Guadalupe R.
San Antonio R.
Nueces R.
Solomon R.
Smoky Hill R.
Kansas R.
Missouri R.
Washita R.
Platte R.
Guadalupe Mts.
Santiago Mts.
Padre Island
St. Joseph I.
Matagorda I.
Houston Ship Canal

Fig. 112


Wheeling
Columbus
Baltimore
Washington
Indianapolis
Cincinnati
Springfield
East St. Louis
St. Louis
Evansville
Louisville
Owensboro
Henderson
Danville
Lexington
Frankfort
Ashland
Huntington
Charleston
Parkersburg
Clarksburg
Fairmont
Morgantown
Martinsburg
Alexandria
Richmond
Charlottesville
Staunton
Roanoke
Lynchburg
Newport News
Norfolk
Portsmouth
Petersburg
Danville
Bristol
Greensboro
Winston-Salem
High Point
Salisbury
Asheville
Charlotte
Gastonia
Rocky Mount
Wilson
Raleigh
Durham
Goldsboro
New Bern
Wilmington
Nashville
Memphis
Chattanooga
Knoxville
Jackson
Columbia
Corinth
Florence
Sheffield
Tuscumbia
Decatur
Huntsville
Gadsden
Anniston
Birmingham
Bessemer
Tuscaloosa
Columbus
La Grange
Rome
Athens
Atlanta
Augusta
Macon
Columbus
Spartanburg
Greenville
Anderson
Florence
Columbia
Georgetown
Charleston
Savannah
Brunswick
Waycross
Albany
Dothan
Bainbridge
Valdosta
Jacksonville
St. Augustine
Gainesville
Tallahassee
Apalachicola
Pensacola
Mobile
Biloxi
Hattiesburg
Laurel
Meridian
Jackson
Selma
Montgomery
New Orleans
Mississippi Delta
Tampa
St. Petersburg
Lake Okeechobee
Palm Beach
West Palm Beach
Miami
Key West
Charlotte Harbor
Florida Bay
C. Sable
C. Canaveral
C. St. George
C. Fear
C. Lookout
C. Hatteras
Cairo
Paducah
Mammoth Cave
Blue Grass Region
Natural Bridge
Pocahontas
Mt. Mitchell
Great Smoky Mts.
Cumberland Gap
Walden Ridge
Cumberland Plateau
Cumberland Mts.
Appalachian Mts.
Southern Appalachian Plateau
Piedmont Plateau
Coastal Plain
Fall Line
Okefenokee Swamp
Dismal Swamp
Albemarle Sound
Pamlico Sound
Florida Keys
Florida Straits
Bahama Islands (British)
Mississippi Sound
Chandeleur Is.
Apalachee Bay
Tortugas
Ohio R.
Mississippi R.
Tennessee R.
Cumberland R.
Kentucky R.
Green R.
Wabash R.
Kanawha R.
Big Sandy R.
Guyandotte R.
Monongahela R.
Potomac R.
Rappahannock R.
James R.
Chesapeake Bay
Delaware Bay
Roanoke R.
Yadkin R.
Pee Dee R.
Santee R.
Cape Fear R.
Neuse R.
Tar R.
Savannah R.
Ogeechee R.
Altamaha R.
Satilla R.
St. Marys R.
St. Johns R.
Suwannee R.
Apalachicola R.
Chattahoochee R.
Flint R.
Alabama R.
Coosa R.
Tombigbee R.
Mobile R.
Pearl R.
Yazoo R.
Red R.
Tallapoosa R.
Tugaloo R.
Oconee R.
Ocmulgee R.
Withlacoochee R.
Hillsborough R.
Peace R.
Caloosahatchee R.
Indian R.
Everglades
Okeechobee Canal
Lake Pontchartrain
Lake Pontchartrain
Lake Borgne
Lake Maurepas
Lake Pontchartrain
Lake Okeechobee
Lake Okeechobee
Lake Okeechobee

Questions on Fig. 112. — 1. Note from Fig. 19 which of these states are in the Southern group. Only the most important features are indicated outside of these states. 2. Make a list of seven of the chief railroad centers in this group of states. 3. Name the most important cities on the Fall Line. 4. Three of the Southern States consist entirely of lowlands. Which are they? 5. If you wish to look up smaller places than are indicated here, refer to Fig. 499 or 501.

Fig. 113. — A cotton boll ready for the picker

The cotton fibers grow in a pod or boll about the seeds. As the seeds ripen the boll bursts and the fiber becomes fluffy as shown in the picture. The fiber is intended by Nature to serve as a protection to the seed during the wet fall and winter.

time for picking comes and many rains would injure the exposed cotton. Thus the rainfall is remarkably well adapted to the needs of cotton. In addition, the cooler weather of early autumn further checks the growth of the stem, and thus aids the development of the cotton *bolls*, or pods.

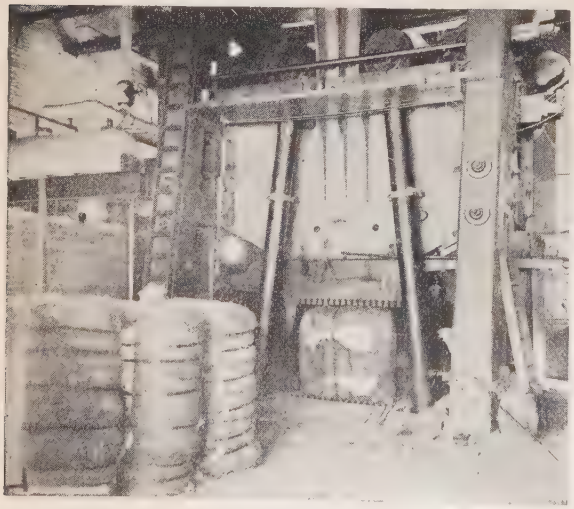
The character of the soil is another important factor. Florida produces very little cotton, as you can see, partly because most farmers are interested in growing vegetables and fruits. Fig. 123 suggests that other parts of the Coastal Plain from North Carolina to Texas grow very little cotton. The most favorable areas are clearly shown by the proportion of land planted in cotton. In what states are they? In what parts of these states?

Three other conditions that favor the raising of cotton

A third and very important matter is abundance of cheap labor. Cotton cannot be raised, as wheat is, largely by the use of machinery. It requires far more labor; and it requires this throughout most of the year, from the beginning of April until the latter part of December. The South is favorably situated to meet this demand. It contains over 8,500,000 negroes, who are peculiarly adapted to work in that climate, and whose greatest single task, therefore, is the raising of cotton.

Finally, conveniences for transportation are a vital factor. There is a surprising number of outlets by water from the Cotton Belt. A very considerable number of navigable rivers reach the sea between Virginia and Texas. Note also on Fig. 112 the number of harbors from which goods can be shipped to any port in the world. Which are the more important ones, judged by the size of the type? Where navigable rivers do not exist, and in very many places where they do, there are railroads.

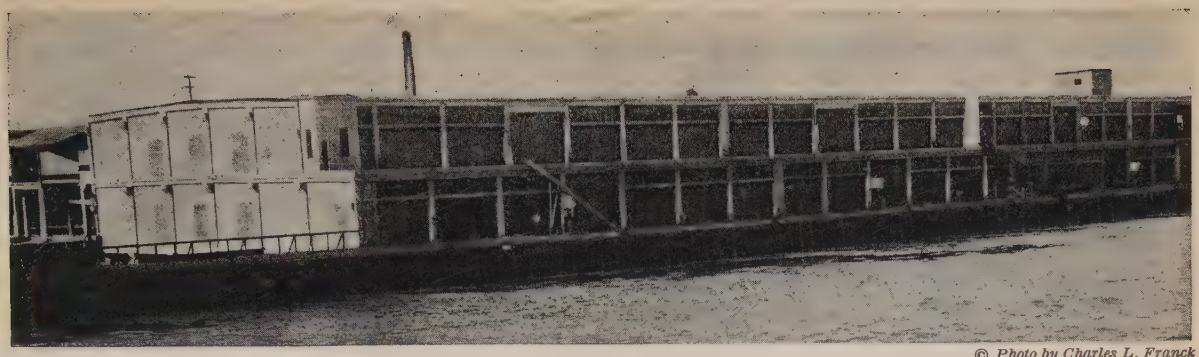
Thus there are four very important con-



© Detroit Publishing Co.

Fig. 114. — A cotton compress

Cotton bales, rectangular in shape, weighing about 500 pounds each, covered with coarse bagging and bound with bands of iron, are pressed by steam compresses into greatly reduced sizes suitable for transportation.



© Photo by Charles L. Franck

Fig. 115. — A cotton warehouse at New Orleans

The volume of exports and imports, which has made New Orleans in some years a port of importance second only to New York, demands modern facilities for handling this vast tonnage. Railroads and river boats bring their cotton cargoes to warehouses like this, and thence this product is shipped to many foreign ports.

ditions that the South meets for the production of cotton, and it meets them to an admirable degree over a wide area. There are many other regions of the world that satisfy some of these conditions; but none that by any means meets them so completely as does the South.

Injury to cotton from the boll weevil. — In spite of these important advantages, the cotton growers of the South do not have things entirely their own way; for cotton has many enemies. The worst is the boll weevil. This is an insect that in the worm stage bores about in the unopened bud, or *square*, of the cotton and eats the growing fiber. In the early 'nineties it crossed the Rio Grande from Mexico and appeared in the fields of Texas. Fig. 116 shows how steadily it has advanced over the Cotton Belt since that time.

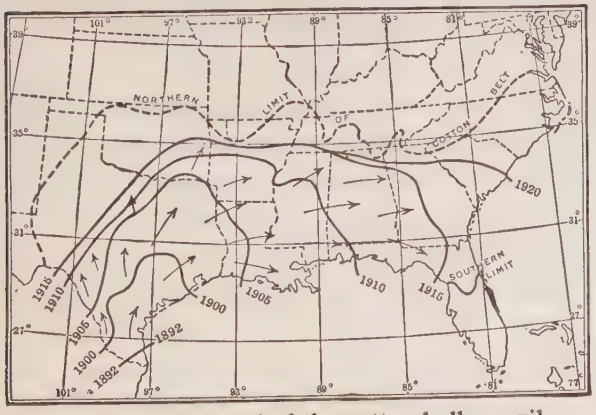


Fig. 116. — Spread of the cotton boll weevil

One of the best ways to reduce the ravages of the weevil is to keep every farm as clean as possible, to burn all weeds, leaves, and other material that might harbor the insects in winter, and to plant varieties of cotton that mature early. Yet enough of them live over to colonize the fields again in the spring.

The boll weevil has cost the South many millions of dollars. In some districts the farmers have at times been much discouraged. But farmers are learning to raise cotton under boll-weevil conditions. Fertilizer and intensive cultivation hasten maturity. This insures a crop before weevils in large numbers can attack the squares and young bolls. In recent years, the ravages have been greatly reduced by the use of a poison (calcium arsenate) in the form of a powder. As we shall see later, the weevil has been considered by many a blessing in disguise.

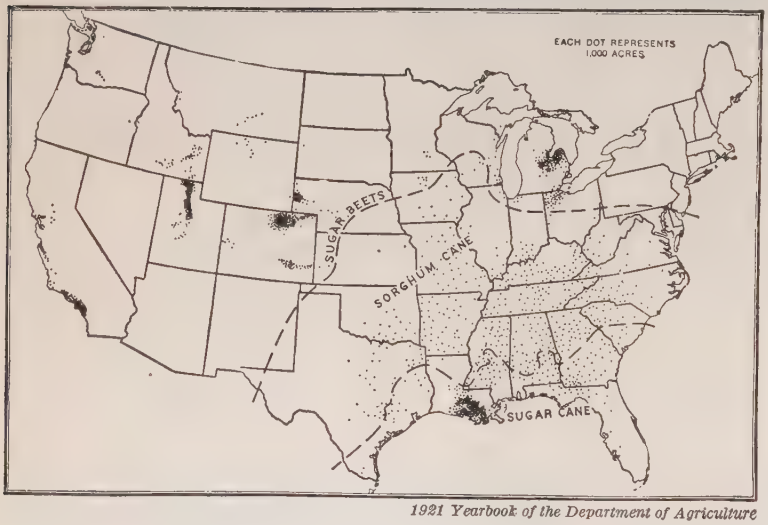
The production of cane sugar in the South. — While small patches of cane sugar are grown in many parts of the South, there

is only one district where the industry is extensive. That lies chiefly in southern Louisiana, on the low, flat lands forming the delta of the Mississippi River, but it extends westward into Texas. Locate this area in Fig. 117. Fourteen parishes in Louisiana raise little else than sugar cane. The plantation here described is in this region.

How the industry is conducted on a typical plantation

1. Its location and character

The land is only a few feet above the level of the Gulf. It is surrounded by dikes and has a costly system of drainage, for the rainfall is about sixty inches per year and averages five to six inches per month during the growing season. Note the rainfall in this district as shown in Fig. 18. Sugar cane requires from fifty to sixty-five inches of rain per year.



1921 Yearbook of the Department of Agriculture

Fig. 117.—Acreage of sugar crops, 1920

South of the lower black line cane sugar is grown; between the two lines, sorghums (p. 144); north of the upper line, sugar beets.

The plantation which we are discussing contains somewhat more than 10,000 acres; it lies along a *bayou*, or estuary, and is fifteen miles in length. This may seem large; but it is by no means the largest plantation in this district.

A superintendent has general oversight of all the farming operations. From 800 to 1,000 persons are employed on the plantation throughout the year, nearly all of whom are negroes. During the planting and the harvesting seasons extra workers are called in, sometimes as many as 300. The laborers live with their families, so that this plantation supports, all together, not less than 2,000 persons. The families are grouped at convenient points for work, each group forming a small village.

2. The workmen required, and the methods they use in growing the cane

Only about 3,400 acres are planted with sugar cane at one time. How many square miles does that make? A large area must be set aside for seed cane, and another for corn and peas. The peas are particularly valuable for restoring the ground to a good condition for growing more cane. These three crops are kept growing in rotation, any one portion of land usually bearing the same kind only once in three years.

There are two planting seasons, one in early autumn and the other in early spring. The fall planting is more profitable, for the young cane comes up earlier, and larger yields are obtained at harvest. Winter weather, however, sometimes kills the sprouts of the fall planting. Sometimes, too, dry weather during the fall months prevents a proper pulverizing of the soil, and as a result the cane is likely to be affected by "dry rot." Spring planting does away with these two difficulties. The ground is prepared by deep plowing and is laid off in furrows six feet

apart in which the cane stalks are laid. To insure a thick growth, two stalks are laid side by side in the furrows. They are covered with soil from three to six inches deep. The cane is cultivated much as corn is, until it becomes too high to permit further cultivation.

Harvest is an especially busy time. The cane has to be cut and stripped of its leaves by hand, after which the work is all done by machinery. It is loaded on large wagons with the help of gasoline engines and hauled to the railroad. There are thirty-five miles of track on the plantation. When the wagon comes to the railroad, its contents are dumped bodily into a freight car, as illustrated in Fig. 119.

3. Method of harvesting, and the yield of sugar

The average yield of cane is from fifteen to twenty tons per acre; but it sometimes reaches twenty-five or thirty. One ton produces about 160 pounds of sugar; and one person in the United States consumes on the average fully eighty pounds. From these figures you can estimate how much sugar one acre produces and also how much sugar is required to supply your family for one year.

The sugar making takes place in the late fall and winter, because the cane is allowed to grow as long as possible in the fall. This plantation is provided with a mill which can grind 1,200 tons of cane per day, so that the average crop can be made into sugar in about sixty days. It generally takes nearly three months, however. Nearly all the men who work in the mill are employed at other times on the farm. This shows the advantage of having the farm and the mill under one management.

The outlook for any great expansion in the cane-sugar industry in the South is not bright, however, for it suffers serious competition from two sources. In the first place, although this delta land is the best for the purpose in the United States, its climate is not so favorable for cane as that of near-by Cuba and the other West Indian islands. Sugar cane is a tropical product and cannot stand frost. It requires twelve months of growth in order to reach full maturity. Although this land is so low and so nearly surrounded by the Gulf that it is warm even in winter, the open Mississippi Basin allows cold waves from the Dakotas (p. 238) to sweep its whole length, and during most winters the temperature

The future of the cane-sugar industry in the South

© *Detroit Publishing Co.*

Fig. 118. — Cutting sugar cane near Baton Rouge, Louisiana

Sugar cane here grows from eight to twelve feet high, with the stalks close together. It is cut by hand when ready to harvest; the cutter, using a long, heavy knife, severs the stalk close to the ground. Attempts to use machinery in the cutting have proved unsuccessful.

drops low enough at some time to harm the cane. In what temperature region is the southern part of Louisiana (Fig. 12)?

Thus the winters shorten the growing season by several weeks, thereby reducing both the quantity of cane and its sugar content. They also necessitate new plantings about every three years, which is expensive because it takes much labor and consumes about one fourth of the previous year's crop. In Cuba the cane lasts throughout the year, and from six to twenty-five crops can be obtained from a single planting.

© Ewing Galloway

Fig. 119. — Loading sugar cane

How many wagonloads do you estimate can be loaded into one freight car?

The other source of competition is the beet-sugar industry, which is gaining ground rapidly. The beets of the United States in some years produce three or four times as much sugar as does the Southern cane, though the beet-sugar industry is only in its infancy. Additional facts about it are presented on pp. 143 and 322.

The promising future for rice production in the South. — The outlook for rice cultivation in the South is far better than for that of sugar. Rice, the world over, is grown in delta lands, where the climate is warm, the soil moist, and the land easily flooded. In the United States it was formerly grown only in South Carolina and Georgia, on the borders of the tidal rivers where the land was diked and could easily be flooded at high tide. The principal area for its cultivation is now in Louisiana, Texas, and Arkansas, as shown in Fig. 120. Since about 1910, however, the Sacramento Valley in California has been producing great quantities of this crop (p. 140). California stands fourth in rice production.

Place and conditions of rice cultivation

Until recently rice has been a very expensive crop, one man in Japan, on the average, being able to farm only one acre of it, and one man in China from one half to two and one half acres. The land on our Gulf coast, however, is very level; and in the 'eighties some farmers from the Wheat Belt who settled in this section discovered that modern machinery could be used there in the production of rice just as in the case of wheat. In the Louisiana-Texas area, therefore, one man cares for as much as eighty acres, and for that reason the cost of rice production is much less than half what it now is in China.

The rice land is divided into fields of twenty

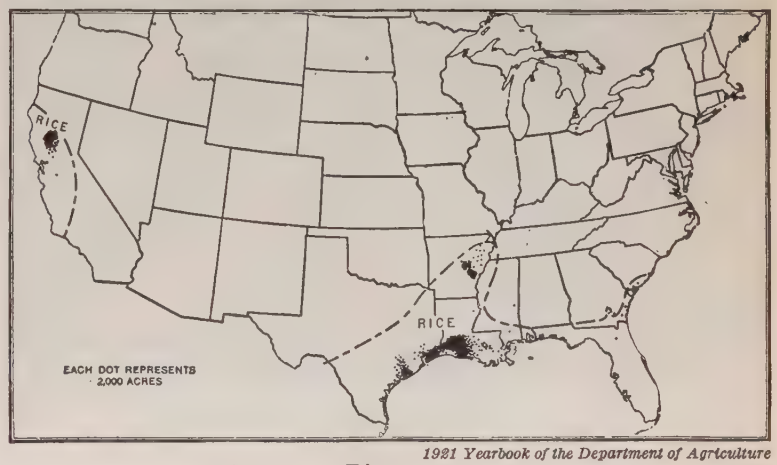
to one hundred acres, with levees running through them to hold the water. The land, while still dry, is plowed and sown with the grain, like wheat land. Then, when the rice is a few inches high, the fields are flooded for two or three months from neighboring bayous or from wells. Shortly before harvest time the water is drained off, so that the ground can dry out and harden. Then the harvesting machines can move over the fields without difficulty.

Because of many favorable conditions there seems to be a remarkable future for rice cultivation in the South. There is throughout the world a tremendous demand for rice, which is likely to increase. Three fifths of all the tilled land in Japan is given up to that product alone, and its value as food in the Orient is more than that of corn and wheat together in America. One person in the Orient on the average probably eats not less than 275 pounds per year, making rice, when the immense population is considered, by far the most important food of the world. On the other hand, we have never become great rice eaters. One person on the average in the United States consumes only 9.3 pounds. If it is so valuable a food in the Orient, it seems reasonable to expect that it will become a much more common food than it has been throughout Europe and America.

Prospects for growth of the industry

Meanwhile, we have been producing only about three fourths as much as we have consumed, although we can raise it so much more cheaply than the Orientals, and have an enormous additional area suited to rice culture. From the Colorado River of Texas eastward to the Mississippi River and then northward along the flood plains of this river as far as Memphis, Tennessee, much of the land is admirably adapted to rice. This district embraces an area several times the amount already under cultivation. Small sections of it are already in rice, as Fig. 120 shows; and the rest of it may soon be utilized.

Extent of cultivation of tropical and subtropical fruits. — Its ability to produce tropical and subtropical fruits gives the South one more advantage in agriculture over the North. The southern location of Florida and the fact that it is so nearly surrounded by warm waters makes it much superior to the Gulf coast farther west in the production of these fruits. The southern third of Florida is quite free from the danger of frost. The only state with which it has to compete seriously is California; it has, however, a decided advantage over that state in its nearness to the New York and Chicago markets.



1921 Yearbook of the Department of Agriculture

Fig. 120. — Rice acreage, 1919

Florida grows more than ninety-five per cent of the grapefruit and over a third of the oranges produced in the United

States, most of the rest being grown in California (p. 141), though all the Gulf states are producing increasing quantities. Many of our pineapples and tangerines are raised in Florida also.

The special opportunity that the South offers to the farmer. — The South probably offers a better opportunity to the man who wants to farm and who has little capital than does any other section that has extensive areas of reasonably good and cheap land. Most of the desirable land in the North and East is now cultivated; but in the South less than one third of the surface is actually cleared for farming, and fully as much more is suitable for crops. Much of this unimproved land is cheap, as farm land goes.

Amount of cheap land

© *Gilliams Service*

Fig. 121. — An orange grove in Florida

Frosts are uncommon in Florida because of its southern location and the moderating influence of winds off the ocean and gulf. (See Fig. 112.) California greatly exceeds Florida in the production of oranges, but Florida leads in the production of grapefruit.

Bordering the Atlantic Ocean and the Gulf of Mexico, from Delaware Bay to the Rio Grande, is the Coastal Plain, as shown in Fig. 123. Near Chesapeake Bay it is only about seventy-five miles wide; but, as the map shows, it widens toward the south and west, includes all of Florida, and extends northward along the Mississippi River even to the mouth of the Ohio River. Notice how much of Texas it includes. This vast area is a low, flat plain that was once a sea bottom. As it was elevated, waves and currents carried away many of the finer materials that make heavy soils. Some sections, like the parts marked Black Belt in central Alabama and also in Texas, are remarkably productive, but the land in general is only moderately rich. Nevertheless, it is well adapted to many kinds of farming. About fifty per cent of the area is still unimproved.

Location of cheap lowlands

Cutting across this Coastal Plain are numerous shallow river valleys that have very fertile bottom lands; the broad, flat plains bordering the Mississippi are also exceedingly rich. Point out these areas. On these bottom lands are many excellent plantations. There are likewise many swamps which, if drained, would rank among the most productive lands in the country.

West of the Atlantic Coastal Plain is a higher plain, called the Piedmont Plateau (Fig. 123), which has to a large extent been stripped of its forests and is now extensively cultivated. Note its location in the eastern portion of

Location of other cheap land

the Appalachian Highland. The soil here contains much more clay than that of the Coastal Plain and on that account allows a greater variety of crops. There are large areas of farm lands here that may be purchased at a moderate price.

The regions marked Southern Appalachian Mountains, Cumberland Plateau, and Allegheny Plateau are, in general, ill suited to farming, although they contain many small fertile valleys. The mountains here are higher than those in Pennsylvania, the highest peak in the entire Appalachian Highland being Mt. Mitchell in western North Carolina (6,711 feet).

Between the mountains on the east and the Cumberland Plateau on the west is the depression known as the Great Valley, much of which has limestone soil and produces excellent crops. More fertile still are the Blue Grass Region in Kentucky and the Nashville Basin in Tennessee. These two regions have soil that is as good as any in the world; it came from the weathering of a limestone that contains phosphate. In many parts of this limestone region, outside of the more fertile districts, much good land is available, and some large areas are only now beginning to be cleared of forests.

West of the Mississippi River, the Ozark Plateau resembles the Cumberland Plateau in its poor conditions for farming; but Oklahoma and western Texas are portions of the Great Plains and have soils similar to those of Kansas, Nebraska, and the Dakotas.

There is another opportunity for the farmer in the South as attractive as cheap land. That is the possibility of making the land more productive through improved methods of farming. Naturally men who do not own the land they cultivate are less interested than owners in keeping the soil, the buildings, the fences, and the farms as a whole in good condition; so that where there are many renters the yield of farm products is likely to be low. Moreover, in many sections the one main crop year after year has been cotton, only enough corn being raised to supply feed. This "one-crop" method has been kept up in many regions until the soil is nearly exhausted.

Possibility of making the Southern land more productive

1. Advantage of "mixed farming"

The progressive farmer has an excellent opportunity to reap profit by introducing improvements, for there are many things in his favor. The boll weevil has been in some

© *Gilliams Service*

Fig. 122. — Pineapples in Florida

The pineapple is a tropical fruit and does not do well in the northern part of Florida. The fruit with its tuft of leaves grows on a short stem and is harvested readily by cutting it free from the stem and lower leaves.

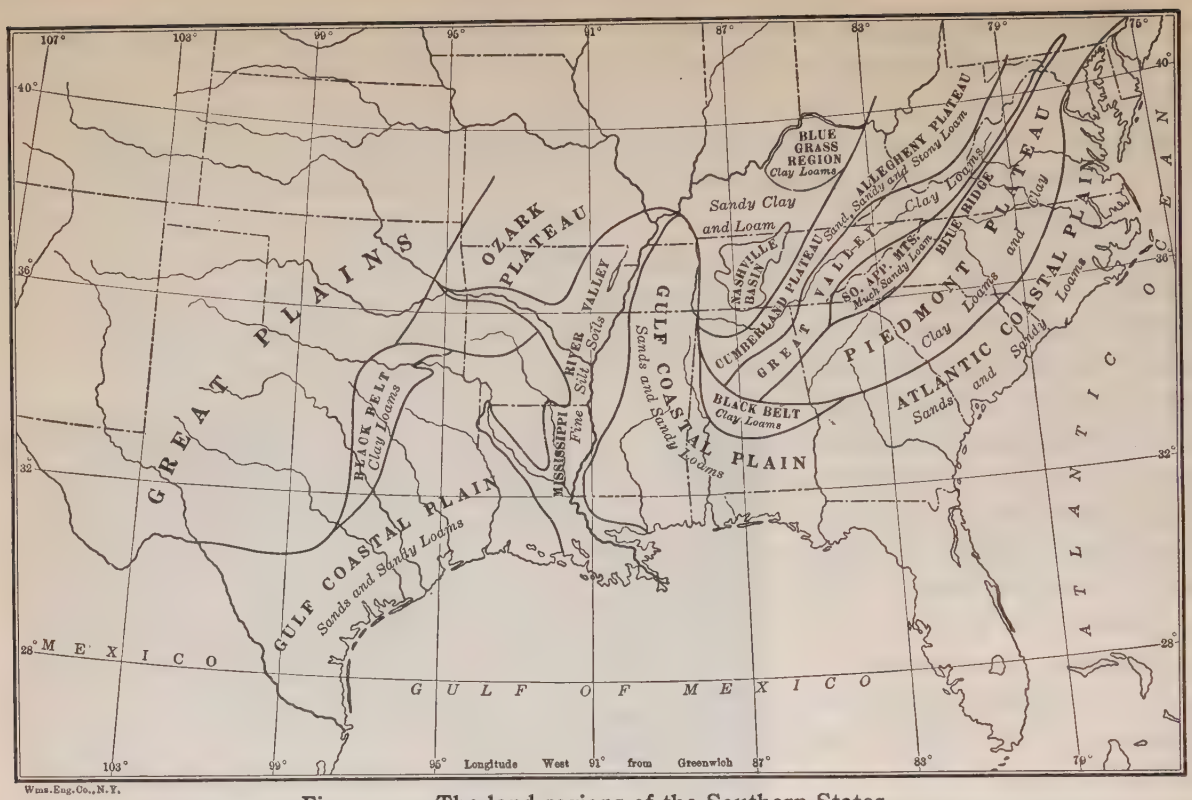


Fig. 123. — The land regions of the Southern States

respects a real blessing. It has destroyed so much cotton that many farmers have concluded it is not wise to trust to cotton alone for a living. In consequence they have planted other crops as well, and thus mixed farming is coming into fashion. The mixed farming opens the way for experiments of many kinds; and the greater the farmer's intelligence and enterprise, the greater his profit.

One important thing is to build up the worn-out soils, as well as to preserve those that are good. To this end soy beans, cowpeas, alfalfa, velvet beans, and peanuts are often cultivated (p. 99); these crops also make it possible for farmers to raise more live stock. The peanut has already come to be a very important Southern crop, furnishing food both to man and to live stock. The fact that far more of natural fertilizer, in the form of rock phosphate, is found in the South than anywhere else in the United States is a great advantage. Florida produces the greatest supply, with Tennessee and South Carolina also yielding large quantities.

Fig. 124. — A log cabin at the top of Mt. Mitchell, North Carolina

This peak is the highest in North America east of the Rocky Mountains (p. 111).

2. Importance of using more machinery

The introduction of more machinery will not only relieve the farmer of much

Fig. 125. — Baling hay in the Blue Grass Region of Kentucky

The Blue Grass Region of Kentucky is a large basin in north central Kentucky covering about one fourth of the area of the state. Its soils, which come from the weathering of limestone, are among the most fertile of our country. A country home of the Southern type appears in the background.

drudgery, but will enable him to cultivate more land and thus increase his income. The value of machinery is well illustrated in connection with rice (p. 108). Since the outlook for rice is so promising, many farmers may specialize in that grain. It is important to know that, while the South is the greatest cotton producer of the world, only about one fifteenth of the Southern land well suited to cotton is now producing it.

It is evident that the Southern States have the climate and soil that will make them one of the great farming regions of the world. In the North there is less opportunity to increase the acreage of corn or wheat or other crops; or the number of swine and beef cattle. At least, a large increase in any one would mean a decrease in some of the others. In the South, however, owing to the quantity of unused land and to undeveloped methods of farming, any one product might be doubled or trebled without checking any of the others.

Fig. 126. — A country home in Texas

In some portions of Texas there are large plantations, with houses as beautiful as that in the picture. The large tree is a pecan. Pecans grow wild in some parts of the South, but in recent years large orchards of pecans have been planted.

Manufacturing in the South. — The low density of population, the abundance of cheap land, and the ease with which manufactured articles can be obtained from the North have discouraged any great development of manufacturing in the South. At present the South does less than one fourth as much manufacturing as the Northeastern States. During the period,

Its present rank in manufacturing

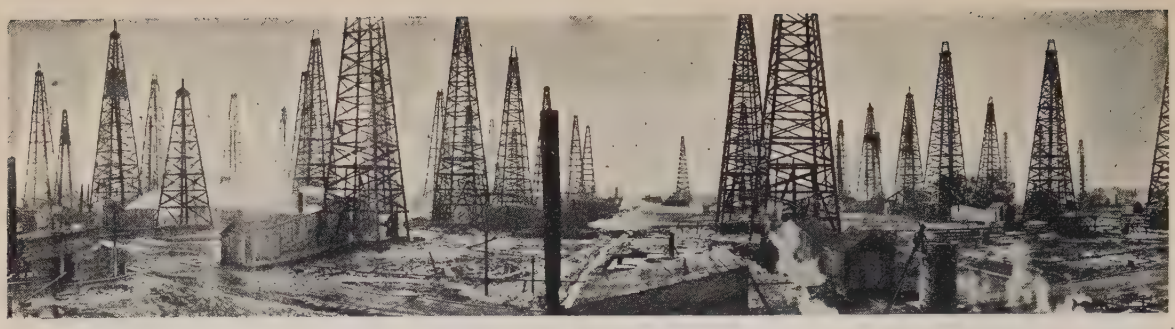


Fig. 127. — Oil derricks

The derricks were used in drilling the wells. In most wells the oil must be pumped to the

however, from 1910 to 1920 it nearly trebled its output of factory goods, which suggests unusual advantages for manufacturing and a new energy and intelligence in that industry. Let us see what its opportunities are for further growth.

Its supply of power for manufacturing

1. Supply of coal

Fig. 4 shows that the principal coal beds of the North extend into these states. Which states are best supplied? Which have none? Locate the nearest sources of coal for the states that have none. What does this map tell you about the abundance of coal within the cotton area? Why is this a question of importance?

2. Supply of petroleum and gas

The United States now produces about twice as much petroleum as all the other countries of the world combined; and about half of our entire amount comes from the South. The chief petroleum-producing states are, in order, California, Oklahoma, Texas, Arkansas, and Wyoming.

a. How these materials were formed

Ages ago when the materials that later formed rock were being deposited on the ocean floor, countless animals and plants were imprisoned and deeply buried among them. These then slowly decayed, forming oil and natural gas. Thus these substances became stored within the earth. Oil of a similar kind is now manufactured from fish; and nearly the same kind of gas often rises from swampy places where plants are decaying.

b. How they are obtained from under the ground

The oil is found stored in sand at a depth of 100 to 3,000 or 4,000 feet below the earth's surface. The sand lies between layers of rock through which the oil cannot pass; and the pressure upon the oil is such that, when holes are drilled down to it, it rises toward the surface and sometimes even gushes forth. The yield per well varies from a few barrels per day to many thousands. The first well sunk in the vicinity of Beaumont, Texas, spouted forth oil in a six-inch column to a height of 160 feet, and yielded 75,000 barrels per day. Since oil is usually worth between one and two dollars per barrel, one can imagine the excitement that followed.

Many of the oil derricks that are now seen in these states are quite new, showing that men are still actively boring for oil (Fig. 127). Numerous valuable wells have recently been discovered, and have had much influence in attracting settlers. Ranger, Texas (Fig. 128), is an example of an "oil town" that sprang up very rapidly near discoveries of oil; and Wichita Falls, in the same state, owes much of its recent growth to the neighboring oil fields, as do also Tulsa in Oklahoma and Shreveport in Louisiana.

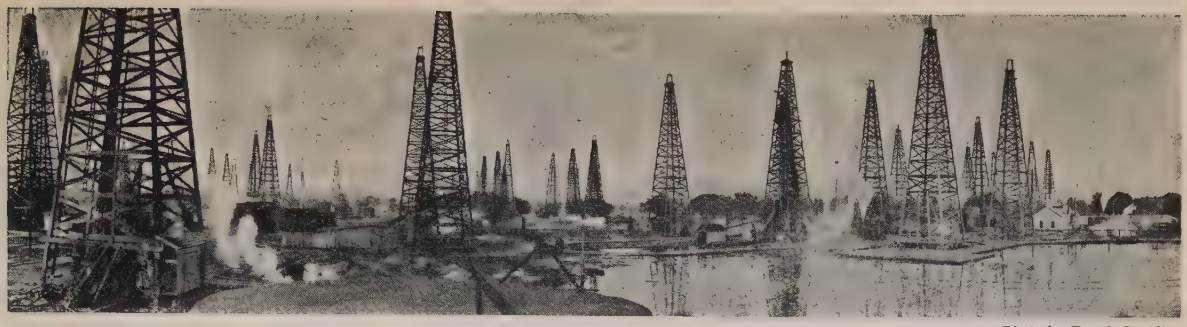


Photo by Frank G. Allen

in the Texas oil fields

surface; the small buildings in the picture contain boilers, engines, and pumps for this purpose.

Natural gas is often found in the same region as oil; both are very valuable as fuel for domestic and factory purposes.

3. Quantity of water power

The South has an enormous quantity of water power. The heavy rains produce many rivers. Because of their steep descent to the sea, many rapids and falls occur along their courses.

Water power is particularly abundant in the Southern Appalachian Mountains and the bordering Piedmont Plateau. Partly because of the importance of these mountains as the source of rivers, the United States Government has purchased many small areas in them for the purpose of preserving the forests, which tend to keep the flow of water in the rivers uniform. Name and count the states that contain and surround these mountains, and that can benefit from this power.

The other area well supplied with water power is nearer the coast. Along the eastern edge of the Piedmont Plateau, where the rivers drop to the Coastal Plain, is a series of falls extending all the way from Baltimore to Montgomery, Alabama. This is the Fall Line to which reference was made on p. 34. As one might expect, a large number of cities are located upon it (Fig. 112). Name the more important cities, and note the state in which each is located.

Water power has long been used in the South in the running of gristmills and sawmills. More recently dams have been built for cotton factories, and now there are more than 13,000 dams for the production of power. Most of the cities in and near the Appalachian Highland and on the Fall Line make extensive use of electricity produced by water power, both for light and for

Courtesy of Ranger Chamber of Commerce

Fig. 128. — Ranger, an oil town in Texas

Wherever large deposits of oil, gold, or silver are discovered a rush of prospectors results and towns are built rapidly. Several oil derricks may be seen in the background. Ranger had less than 1,000 population in 1916; in 1920 its population was 16,000.

© Canfield and Shook

Fig. 129. — Richmond from the James River

The bridge is one of several that span the James River and connect the northern and eastern portions of Richmond. This city, by way of the James, has direct steamer communication with New York, Philadelphia, Baltimore, and other ports.

running factories and street cars. Yet only a small part of the possible water power has been brought into use.

What conclusion do you draw, therefore, about the future supply of power from coal, oil, and running water in the South for manufacturing?

Influence of the forests on manufacturing

For some years the South has led the forest regions of the United States in the production of lumber; it now has about 19,000 sawmills and produces about two fifths of the lumber of the country. Lumber in the South was first produced on a large scale in North Carolina. The Southern pine is the principal kind of tree found throughout the Coastal Plain. In the forests of North Carolina, tar, pitch, and turpentine were first produced in large quantities. These are obtained from the resinous sap of this pine, and are commonly called *naval stores*.

For many years Savannah was the leading port for the export of forest products. The lumbering has gradually moved westward, so that now the most active center for the industry is on the Coastal Plain of Louisiana and Mississippi. The hardwoods, such as oak, gum, chestnut, and hickory, are shown by Fig. 14 to come from the states farther north and west. West Virginia, Kentucky, Tennessee, and Arkansas now lead in the production of hardwood; Memphis in Tennessee is our leading hardwood center.

While production of lumber has been the chief manufacturing industry in the South, the forests are being so rapidly exhausted that its importance is likely soon to decline. Certainly many of the sawmills will cease to operate in the near future.

The manufacture of furniture and farm implements has reached no such proportions as in the North Central States (p. 92); it is nevertheless carried on extensively, and with the expected increase in population is likely to develop rapidly.

Influence of the farm products on manufacturing

We have seen what a stimulus the extensive farm products of the North Central States have given to manufacturing (p. 76). A similar influence is felt in the South. Cotton being the leading agricultural product, cotton manufacture now exceeds lumbering in importance. It is carried on most extensively on the Piedmont Plateau,

1. Influence of cotton

a. Extent of cotton manufacturing

where raw cotton and water power and coal are all at hand.

At one time almost all the cotton manufacturing in this country was done in New England; but the South has long done some spinning and weaving, and in recent decades has greatly increased the number of mills. Fig. 134, in which each dot represents one mill, suggests their number and also shows their location. Which states are in the lead? Compare Fig. 134 with Fig. 110 to find out whether cotton mills are most frequent in the most productive parts of the Cotton Belt.

Few Southern mills attempt to manufacture the finer kinds of cotton goods, partly because they lack the skilled labor that comes from long experience in this industry; but coarse cotton goods can now be manufactured more economically in the South than in New England.

The following facts regarding an Alabama cotton mill give some idea of the meaning of one of the little dots on the map. This particular mill employs 600 persons, including men, women, boys, and girls. Every workday this mill uses fifteen bales of cotton, weighing about 500 pounds each. Since the average yield per acre in most states is less than 200 pounds, you can easily estimate how many acres of cotton are grown yearly to supply this one mill. In this mill, as in many others, white people are employed to do the work.

Many of these mills are in the cities, as might be expected. Compare their location, as shown in Fig. 134, with that of the leading cities in the Cotton Belt. Many of the mills, also, are in the country; in such cases there are villages near by. Some of these mill towns are already so large that they have their own schoolhouses and churches.

Cottonseed was formerly thrown away or used as feed for stock, although there are about two pounds of seed to one pound of cotton, so that it forms a large part of the crop. It has now become very valuable, for it has been found that the oil which it contains can be made into many products. The better grade of cottonseed oil is used in making oleomargarine, cottolene, and salad oil, and as an imitation olive oil. Some is used in making soap, some for packing sardines, and some as a substitute for linseed oil in

b. Products manufactured from the cotton-seed

Courtesy of Crosby-Chicago Adv. Agency

Fig. 130. — Timbers cut in the sawmills at Bogalusa, Louisiana

This mill can cut timbers as long as seventy-five feet for ships and bridges. What is the size of the long timber in the picture? At such large mills the logs may be sawed very economically. The waste of lumber at most small mills is from one third to one fourth of the log.

© Publishers' Photo Service

Fig. 131. — A turpentine still

This apparatus is used to distill spirits of turpentine from crude turpentine. The crude turpentine is poured into the still, the upper portion of which is seen in the center of the open building on the left. This is heated by a fire in the furnace beneath and the turpentine passes off as vapor through the long crooked pipe into a coiled pipe surrounded by cool water, where it becomes a liquid.

© Publishers' Photo Service

Fig. 132. — Rosin on the docks at Savannah, Georgia

Savannah is still the greatest shipping point for naval stores in the South, although the naval-store industry has moved westward. This rosin will be shipped to various parts of the world, especially to the Northeastern States and Europe, there to be further refined. Rosin is used in varnishes, in giving gloss to paper, in making soap, and in many other ways.

paints. Even the part of the seed that is left after the oil is pressed out is valuable, making an excellent food for cattle, and a good fertilizer.

2. Influence of other farm products on manufacturing

The extensive cultivation of tobacco has led to tobacco manufacturing in a large number of Southern cities. The most important tobacco centers are Richmond, Lynchburg, Louisville, Durham, and Winston-Salem. One reason for the leadership of these cities in this industry is suggested in Fig. 105. What is it? The cultivation of sugar cane and rice leads to further manufacturing. Since New Orleans and other cities in Louisiana are near the cane and rice fields, much of the rice polishing and sugar refining takes place there.

© Bluff City Engraving Co.

Fig. 133. — A lumber-yard scene at Memphis, Tennessee

Memphis is one of our most important hardwood centers. Where does the hardwood come from?

As more land is brought under cultivation, and as the methods of farming are improved, the increased production

will, no doubt, result in a corresponding increase in manufactures. Dairying, meat packing, and many other industries will then become more prominent.

Influence of minerals on manufacturing

1. Bauxite

The United States leads the world in the production of aluminum, and all our bauxite — from which aluminum comes — is obtained from Georgia, Alabama, Tennessee, and Arkansas. Until recently the ore was shipped North for smelting and refining, but now there is a large plant for that purpose in Tennessee. The crude aluminum, however, is sent North for manufacture, the largest aluminum rolling and stamping mill in the world being located in northern New Jersey on the Hudson River. What articles can you name that are made of aluminum?

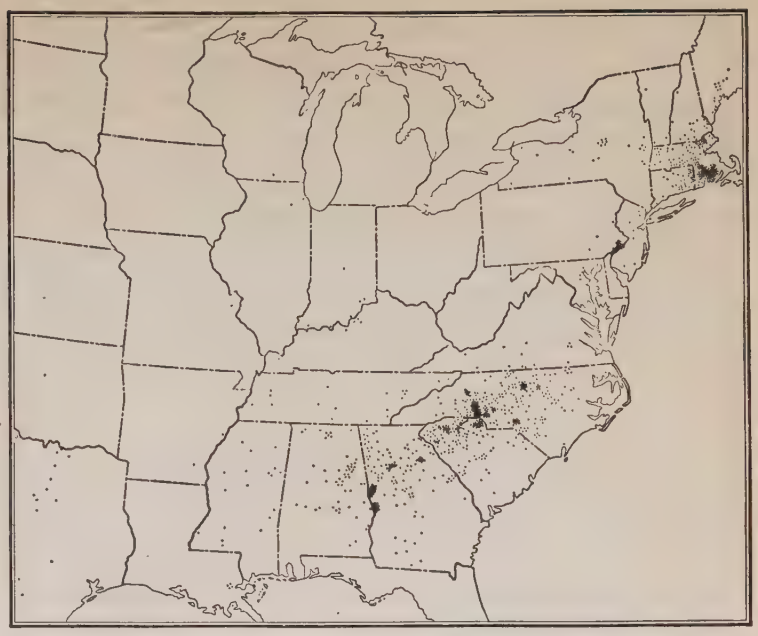


Fig. 134. — Cotton mills in the United States

Each dot represents a mill.

2. Sulphur

Sulphur is a very valuable mineral product used in making acids, in vulcanizing rubber, and for medicine and matches; many sulphur products are manufactured chiefly in the South. Until a few years ago most of our supply of sulphur came from Italy; but now it is obtained from Louisiana and Texas.

Fig. 135. — Loose-leaf tobacco warehouse, Lexington, Kentucky

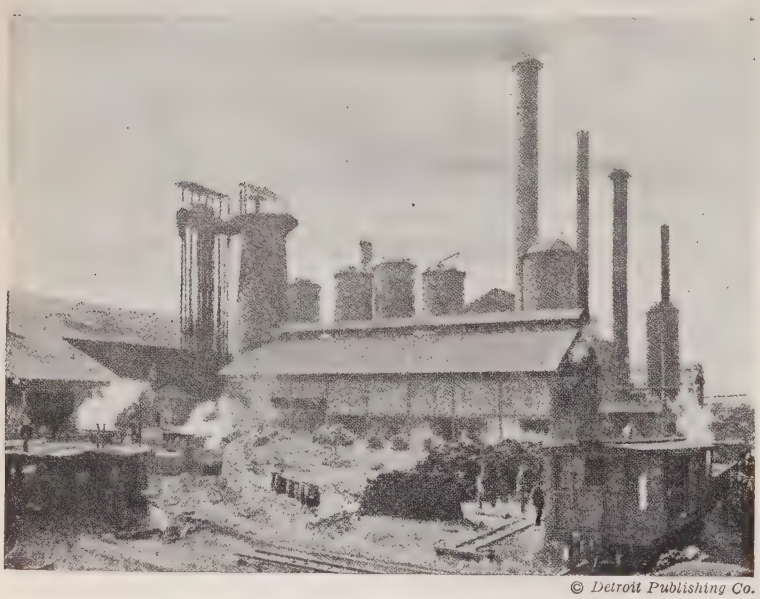
In the tobacco regions of North Carolina, Kentucky, and Tennessee there are loose-leaf warehouses in most cities and towns. The tobacco leaves when stripped from the stalk are graded and several leaves of the same grade are tied together to form a *hand*. The hands are piled up in circular piles as seen in the picture.

3. Iron Ore

Some copper is mined in eastern Tennessee; this mountainous area is also important for its iron ore. Fig. 4 shows where deposits of iron ore have been discovered in the South. Locate the principal points. Note that the Appalachian Highland is the only region in the South in which this ore is now extensively

mined. The chief centers for iron and steel production are Birmingham, Alabama, and Chattanooga and Rockwood, Tennessee.

Birmingham has remarkable advantages as a site for the iron and steel industry. Coal, iron ore, and limestone are mined within a few miles of each other in that vicinity, which gives this region one distinct advantage over Pittsburgh and the other iron and steel centers of the North. Furthermore, it is near the Gulf ports of Mobile and New Orleans, and thus within easy reach of the countries of Central and South America.



© Detroit Publishing Co.

Fig. 136. — A blast furnace in the Birmingham district

There are about thirty blast furnaces in and near Birmingham, in addition to many steel plants making sheet steel, rods, nails, rails, and machinery.

Conveniences for transportation. — As we have seen, there is a large number of navigable rivers in the South. Does the large rainfall help to explain this? Locate on Fig. 112 the Tennessee and Cumberland rivers; the Arkansas and Red rivers. Most of those on the Atlantic coast are navigable for only a short distance. Can you give the reason? If you do not see it, perhaps Fig. 112 will suggest it to you.

Importance of waterways

Before the days of railroads, these rivers carried great quantities of freight; but the railroads, as in the North, have now absorbed most of it. The most important river of all, of course, is the Mississippi; the part of it that carried the heaviest traffic in a recent year was the section between New Orleans and Vicksburg. Yet it carried in that year only 2,239,000 tons of freight, while 87,000,000 tons were carried through the Soo Canal (Fig. 99), and the Norfolk and Western Railroad hauled 31,000,000 tons of soft coal alone to the Atlantic seaboard. The rivers, however, still carry some freight and are always available for greater use if railroad rates become too high.

Reasons for the routes of the principal railways

Fig. 233 shows the trunk lines of railroad in the South. How do they compare in number with those in the North? What extensive areas lack railroads? Can you recall any reasons why they are wanting there?

Many of the roads run north and south, connecting the large cities in the grain and food producing sections of the North with the Southern ports, such as Houston and Galveston, New Orleans, Mobile, and Savannah. Trace some of these roads and find their names as indicated on the map. They haul farm products and manufactured goods southward for export to Central and South America or Europe, and carry tropical products and early vegetables northward.

Other trunk lines extend northeast, connecting the South with Washington, Baltimore, Philadelphia, New York, and Boston. Trace these lines and find their names. Knowing the products and needs of the Northeastern States, as well as those of the South, mention some of the most important kinds of freight that you would expect to be carried in each direction.

One of the leading railroad centers of the South is Atlanta, Georgia. Northeast of it for 500 miles there is no easy pass east and west across the Appalachian Highland; in fact until 1880 in all that distance no railroad crossed it. Atlanta, however, lies to the south of this highland, so that roads connecting the sections to the northeast and southwest, and those to the southeast and northwest, can come together at this point. Thus Atlanta has become an important rail center in much the same way as Chicago, except that in one case mountains have determined the direction of the roads, while in the other this has been done by water.

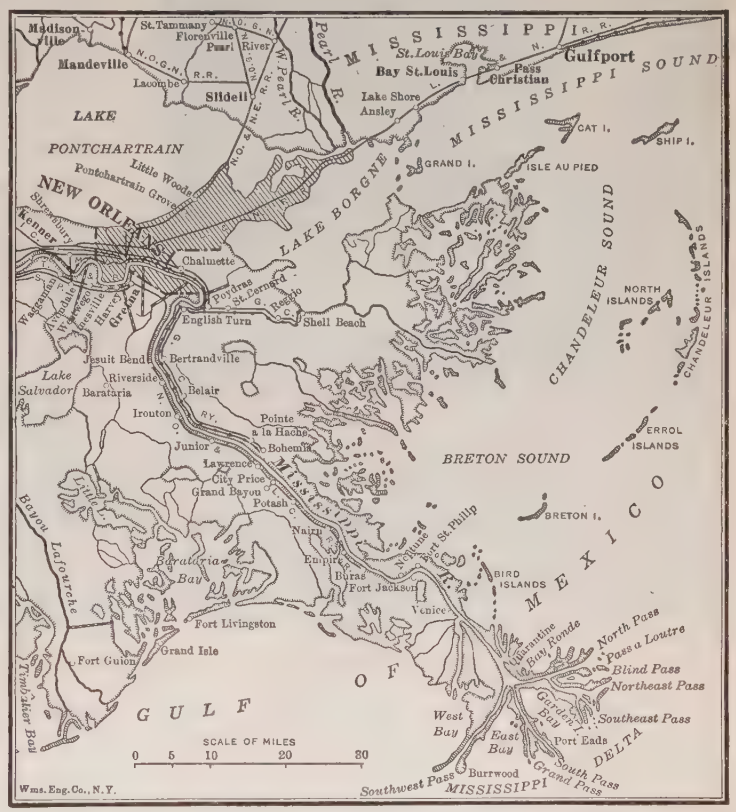


Fig. 137. — New Orleans and the Mississippi delta

Facts determining the importance of New Orleans. — New Orleans is located about 100 miles above the mouth of the Mississippi River. On the map (Fig. 137) you see that an arm of the sea, called Lake Pontchartrain, extends close to the river, and that the city is situated at the place where the river and the lake are nearest to one another. At this point the Mississippi makes a great bend in the form of a half circle or crescent, which explains why New Orleans is often called the Crescent City.

Reasons for its exact location

This particular site was selected partly because the sailing vessels of two centuries ago could reach it by crossing the lake, while they could not easily sail up the narrow river against the current. Below that point the land is too low and swampy for a city.

When we recall the advantages of New York City's connection by water with the West, some of the reasons for the growth of New Orleans become clear. Pittsburgh, Kansas City, and the Twin Cities can all be reached from it by water. Show the routes and name the rivers followed. Compare the distances with those from New York to Duluth

Advantages of this location for commerce

© *Ewing Galloway*

Fig. 138. — In the old French quarter, New Orleans

The paving stones were brought from the West Indies, having been used as ballast during the voyage. How can you tell that these are old buildings?

and to Chicago. Estimate the distance, also, from Pittsburgh to Kansas City.

These water connections led in early days to the rapid growth of New Orleans. As it grew, railroads were built to it, so that it is now one of the leading rail centers in the South. The railroads in its vicinity not only penetrate to various inland sections, but they also parallel the Mississippi and the other rivers.

Thus New Orleans is the southern gateway to and from the most productive valley in the world. Its location in the South corresponds to that of New York in the Northeast, and it faces the rapidly developing countries south of us just as New York faces Europe. Note how the Panama Canal has shortened the distance to the western coast of South America. Trace that route (Fig. 495).

The canal has shortened the route to our own western coast and to Asia, thus greatly improving the opportunity of New Orleans for trade with one half of the world.

With all these advantages, it is not surprising that New Orleans is the chief city of the South, and one of the leading markets in the United States for cotton, sugar, rice, coffee, and bananas. It likewise handles great quantities of tobacco, lumber, grain, nitrate of soda (p. 270), and other products. Can you explain the reason why these particular articles are prominent in its commerce? Name some goods that would be likely to be sent from New Orleans to Europe, and others that would be likely to be received in return. The city has greatly enlarged its harbor in recent years, and its commerce is rapidly increasing.

With all these advantages, why is not New Orleans a far larger city? It is less than one fourteenth the size of New York; and while in some years it ranks next to New York in imports and exports, it is a very poor second, having only about one seventh the foreign commerce of that city. How are such differences explained?

Some of the disadvantages of this location in comparison with that of New York City

There are several answers. In the first place, New Orleans is not now the principal gateway to and from the largest part of the Mississippi Valley; New York City has taken its place. Before the construction of the old Erie Canal and of the railroads, New Orleans was practically the sole outlet and point of entrance for this vast territory. Now New York and the other great Northeastern ports are the chief gateways for this region. Even West Virginia and Kentucky are now closely connected with the East by the Baltimore and Ohio, the Chesapeake and Ohio, and the Norfolk and Western rail-

roads. Trace their routes in Fig. 233 and note their terminal points. There is comparatively little of the vast Mississippi Valley north of Tennessee and Arkansas whose commerce is closely connected with New Orleans.

Again, New Orleans has important competitors in the South. West of it are the ports of Houston and Galveston, which handle a large share of the foreign and coast trade of Texas. Estimate their distance from New Orleans. A shorter distance to the east is Mobile, which serves as a port for the region to its north. Such competition on both sides leaves only a comparatively small area to New Orleans itself.

Finally, in facing South America rather than Europe, New Orleans suffers by comparison with the Atlantic ports. Compare Europe and South America in population (p. 477). Europe is the commercial center of the world, and on that account our ports that are nearest to it secure a vast trade. Nevertheless, New Orleans is assured of a very extensive trade in Southern products; for as the countries south of us increase in population, its commerce is sure to increase in like measure.

© Detroit Publishing Co.

Fig. 139. — The levee near New Orleans

Reasons for the small population of the other coast cities. — Next to New Orleans the largest coast city in the South is Houston. It is reached by a ship canal thirty-six miles long, leading from Galveston Bay (Fig. 112). Note the situation of Galveston. These two cities make this portion of Texas by far the busiest shipping point in the South with the exception of New Orleans.

Importance of Houston, Galveston, and Norfolk

Remembering that these two ports are the principal outlet by water for the largest state in the Union and Oklahoma as well; that great quantities of rice, sugar cane, and cotton are raised in that region; that much oil is obtained not far away, as well as wool, hides, and meat from the ranches of western Texas — you know the principal articles that are exported. What kinds of manufacturing would you expect in the interior cities of Texas and Oklahoma?

The third coast city in importance in the South is Norfolk, Virginia. Describe its location and note other cities near it. It has a fine harbor, and rail connection not only with other points in the South, but also with the Mississippi Valley, as stated on p. 122. What reasons can you suggest for its being one of the important coaling stations of the world?

Houston and Norfolk have each a population of between 100,000 and 150,000. Along the coast between these two there are, aside from New Orleans, a half dozen cities that contain more than 50,000 population. How many of them can you name and locate? There is not one, however, that reaches 100,000. Estimate the length of

Size of coast cities between Galveston and Norfolk, with explanation

Fig. 140. — Warehouses along

This canal, made by deepening and widening Buffalo Bayou, makes it possible for large ocean vessels to reach

coast line between these two points. In that great distance why are the cities all so small?

One explanation is the fact that there are so many that no one of them is a port for any very extensive territory inland from it. Paralleling the Atlantic coast is the Appalachian Highland, which for hundreds of miles presents a barrier to transportation. Estimate its distance from the coast. Because of this barrier, several of these ports can be gateways only for the territory between the mountains and the ocean. Name the cities that are limited in this way. In addition, as we have seen, a large part of the manufacturing for the area east and south of the mountains is located on the Fall Line (p. 115). Thus the coast cities are mainly shipping points rather than manufacturing centers, and are small because thus limited mainly to one occupation.

© *Detroit Publishing Co.*

Fig. 141. — Sea wall and beach at Galveston

Galveston is built on an island which is so low that, were it not for this sea wall, the city would be flooded in time of storm. This wall is made of reënforced concrete and is sixteen feet in height.

The contrast between North and South in location of chief cities.—The South forms a striking contrast to the North in the location of its chief cities. Of the ten largest in the North every one is on an important waterway, and most of them are on the

Lack of dependence of Southern cities upon waterways for their importance

the Houston Ship Canal

Photo by Frank G. Allen

Houston from the Gulf of Mexico. Note from Fig. 112 the importance of Houston as a railroad center.

Atlantic coast or the Great Lakes. Show that this is true.

The ten largest cities in the South, in the order of their size, are as follows: New Orleans, Louisville, Atlanta, Birmingham, Richmond, Memphis, San Antonio, Dallas, Houston, Nashville. Locate each of these. How many cannot be reached by water? How many are on water routes that, so far as you can judge from preceding statements (p. 124), are not extensively used for river transportation? Show the contrast with Northern cities in this respect.

Four out of the eight leading cities not reached by ocean vessels are on navigable rivers. These four are Louisville, Richmond, Nashville, and Memphis. Name and trace the river on which each is located.

Causes of the growth of the river cities

While these rivers are of importance for transportation, other conditions have had far more influence on the recent growth of these cities. Richmond has abundant water power for manufacturing from falls in the river on which it is situated. Louisville is near fertile districts in which tobacco is one of the leading products. Both these cities are prominent tobacco markets and are engaged in extensive manufacture not only of tobacco goods (p. 118) but also of articles required in a rich farming country. Locate Louisville with reference to the Blue Grass Region of Kentucky.

Fig. 142. — The Alamo Plaza, San Antonio, Texas

The famous Alamo church, where a small body of Texans was wiped out by a greatly superior force of Mexicans in 1836, is seen near the end of the boulevard on the right. San Antonio is a city of many beautiful parks.

© Brown Bros.

Fig. 143. — In the business section, Louisville

Courtesy of Atlanta Chamber of Commerce

Fig. 144. — Office buildings in Atlanta

With the exception of some of our oldest cities, such as Boston, and of those built on hills, like San Francisco and Seattle, the downtown districts in most of our large cities are surprisingly similar in appearance. The streets are in general straight and laid out regularly, and many-storied buildings are frequent. Glance through the chapter on Europe (pp. 279–382) and note as many differences as you can between American and European cities.

Memphis and Nashville, convenient to the hardwood forests, are leading lumber markets; since the former is surrounded by cotton fields and the latter is in the rich Nashville Basin, both are likewise centers of trade with the neighboring farming districts. Memphis is the most important interior cotton market in the United States and manufactures great quantities of cottonseed oil; while Nashville is a flour-milling center.

© Manufacturers' Aircraft Assn.

Fig. 145. — An airplane view of Jacksonville, Florida

On what river is Jacksonville? This port in recent years has greatly increased its commerce. What products would you expect to be shipped from this port?

The importance of the four leading interior cities

Important reasons for the growth of Birmingham and Atlanta, entirely independent of navigable rivers, have already been stated on pp. 120–121.

Their location within the Cotton Belt is also an important factor. How must this affect their trade and manufacturing and consequently their population?

Dallas, Oklahoma City, and Little Rock, likewise without water transportation, owe their prosperity to the rich farming country about them. How near are they to the Black Belt of Texas? To the Cotton Belt? San Antonio is near a very important live-stock region, and also owes part of its prosperity to an extensive trade with Mexico. What other important centers, though smaller, do you see in Texas and Oklahoma (Fig. 112)?

Courtesy of U. S. Forestry Service

Fig. 146. — Hauling logs to the mill

Logging railroads also are common in Arkansas, Texas, and Louisiana.

Facts to be especially well fixed. — 1. Location of each of these states. 2. Of the leading interior cities. 3. Of the leading ports. 4. Character of the surface. 5. Climate: the distribution of rainfall and the temperature regions. 6. Principal farm products, and where each is grown. 7. Location of coal and petroleum. 8. Of iron ore. 9. Chief kinds of manufacturing. 10. Kinds and locations of forests. 11. Names and location of leading water routes.

Problems for independent study. — 1. Why have immigrants from foreign countries generally gone to the North and West rather than the South? Why has our own population tended to move westward rather than southward? Consider in which section Europeans could grow crops with which they were familiar and in which the demand for unskilled foreign labor has been greater. Also Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, p. 306 (Wiley). 2. Write some advertisements that might attract immigrants to the South. 3. Make a sketch of the Southern States, showing state boundaries and principal rivers, mountains, and cities. 4. In how many ways are peanuts valuable? World Book, vol. 6, p. 4541; Chamberlain, J. F.: *How We Are Fed*, "Peanuts" (Macmillan). 5. Find how our government has aided in fighting the boll weevil. Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 56–57 (Ginn); Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, p. 360 (Wiley); World Book, vol. 2, p. 1607. 6. What other enemies has cotton? Sanderson, E. D.: *Insect Pests of Farm, Garden, and Orchard*, pp. 241–272 (Wiley). 7. Compare the method of obtaining maple sugar with that of obtaining cane sugar. Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 68–72, 77–79; Carpenter, F. G.: *North America* (1915), pp. 158–164; National Geographic Magazine, 1920, vol. 38, pp. 24–30; McMurry, C. A.: *Type Studies from the Geography of the United States*, pp. 209–217 (Macmillan). 8. Make a drawing of the typical sugar plantation described in the text, showing buildings, fields, and railroads as you imagine them. 9. Make a clay or sand model of the Southern States, and show sections where there is good and cheap land. 10. In what ways does the Appalachian Highland affect the geography of the South? Mill, H. R.: *International Geography*, pp. 715–718 (Appleton); Robinson, E.: *Commercial Geography* (1910), pp. 145–146 (Rand McNally); Mc-

Murry, C. A.: *Larger Types of American Geography*, pp. 1–36 (Macmillan). 11. Nashville is an important center for education. Find what educational institutions are located there. 12. Here is a question for debate: *Resolved*, that our government should charge a high enough tariff on all imported sugar to make the cane-sugar industry of the South profitable. Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, p. 38 (Wiley); Smith, J. R.: *Industrial and Commercial Geography*, pp. 281–283, 285 (Henry Holt). 13. Why must the reclamation of swamp lands usually be undertaken by the government or by large corporations rather than by individuals? Fisher, E. F.: *Resources and Industries of the United States*, pp. 22–25; Gibson, J. C.: *Wealth of the World's Waste Places*, Chapter XVI. 14. The flood plains of the Mississippi River have at least two and one half times the area of the Nile River flood plains. How many people would they support if they were as thickly populated as the latter (p. 480)? 15. Make as full a list as possible of articles manufactured from aluminum. *Encyclopædia Britannica*, vol. 1, pp. 771–772; Tappan, E. M.: *Diggers in the Earth*, Chapter IX (Houghton Mifflin). 16. Write a composition showing the possible future of fishing in the South. National Geographic Magazine, vol. 35, 1919, pp. 476–488. 17. Find how the mouth of the Mississippi River is kept deep enough for large ocean vessels, and how the river has been kept under control. Carpenter, F. G.: *North America* (1915), pp. 149–150; *Encyclopædia Britannica*, under the title *Mississippi River;* Whitbeck, R. H.: *High School Geography*, pp. 135–146 (Macmillan). 18. Consult the magazines for the year 1900 to learn about the disaster at Galveston that made it necessary to construct the expensive breakwater shown in Fig. 141. 19. In what ways are the North and South dependent upon each other? 20. On an outline map indicate the chief agricultural, lumber, and mineral regions of the South.

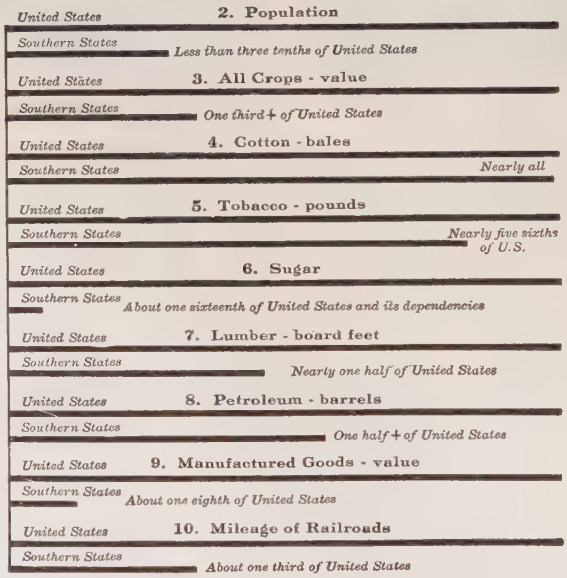


Fig. 147. The Southern States compared with the entire United States (1920)

How to get help from friends in your study. — People are one of the best sources of information. One can frequently learn more by talking with a well-informed person than by reading. When you desire to secure information in this way, first consider who in your neighborhood is most likely to be able to help you with it. If it is only one fact that you need, you may perhaps get the answer by a single question. But often a longer conversation will be necessary; this should be planned in advance with some care. You ought to prepare several questions and test them to see whether they call for just the information that you require. When the interview takes place, you should stick closely to your subject until you have accomplished your purpose. Often it is advisable to take a few notes during the conversation; paper and pencil should, therefore, be at hand. After the conversation, think it over and write out the leading thoughts or facts obtained.

4. The Western States

State	Area in Square Miles	Population (1920)	Largest City	Population (1920)
Arizona	114,000	334,000	Phoenix	29,000
California	158,300	3,427,000	Los Angeles	577,000
Colorado	103,900	940,000	Denver	256,000
Idaho	83,900	432,000	Boise	21,000
Montana	147,000	549,000	Butte	42,000
Nevada	110,700	77,000	Reno	12,000
New Mexico	122,600	360,000	Albuquerque	15,000
Oregon	96,700	783,000	Portland	258,000
Utah	85,000	449,000	Salt Lake City	118,000
Washington	69,100	1,357,000	Seattle	315,000
Wyoming	97,900	194,000	Cheyenne	14,000

Questions. — 1. The two most sparsely populated states in our country are contained in the above list. Which are they? 2. Two of our three largest states (in area) are in this list. Which are they?

Density of population of the West compared with that of the other sections of the United States. — In the population map of the United States (Fig. 16), the West is seen to have few inhabitants in comparison with the East, the South, and the Middle West. In Fig. 148, it is easy to compute the population of most of these states. What surprising facts do you find, in comparison with the states east of the one-hundredth meridian? How does the population of all eleven states combined compare with that of New York or Pennsylvania?

The small population is not due to smallness of area, because this group of states is much larger than any of the three groups already studied; in fact, it contains about two fifths of the entire area of the United States. These eleven states average more than 100,000 square miles each, as you can discover for yourself by examining the figures at the beginning of this section; this is twice the average for the thirty-seven other states. The population of this group

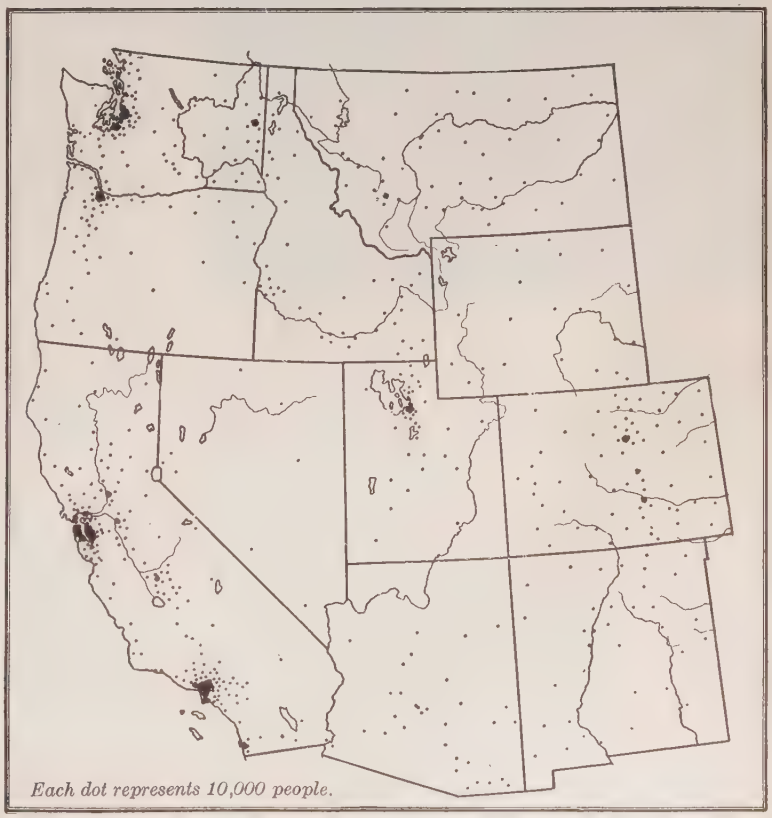


Fig. 148. — Distribution of population in the Western States

of states is thus seen to be much less dense than that of any other section of the country. This is partly because the entire width of North America lies between them and the older settlements along our eastern coast. It is in large measure, however, due to the fact that, throughout a large portion

© Ewing Galloway

Fig. 149. — An irrigated area near Tucson

Locate Tucson. This view shows how the scrubby vegetation of the semi-desert is replaced in irrigated areas by luxuriant crops. Note the large cactus in the foreground and the regular outlines of the tilled fields in the background.

of this section, lack of rainfall presents obstacles to agriculture that are not encountered elsewhere in the United States.

Why the population is so unevenly distributed. — Even within this group of states, moreover, there are striking differences in density of population. This is chiefly due to differences in rainfall. Ordinary farming, where special methods are not adopted to conserve moisture, cannot be carried on with much less than thirty inches of rain. Fig. 18 shows that the rainfall over most of this section is considerably less than that. Portions of three states, however, receive more. Which are they? How many receive less than twenty inches over the greater part of their surface? Which have large sections that receive less than ten inches? Such land is desert or semi-desert. Observe the fact that the Western States include both the most arid and the most humid regions of the United States. By comparing Fig. 18 with Fig. 148, note the effect of rainfall here upon population. Important exceptions to the rule that the most densely populated regions are the best watered occur in the case of irrigated areas and mining districts.

Early in our history small but prosperous agricultural settlements were scattered along the Pacific coast at points where the mild temperatures and luxuriant vegetation tempted the explorers to remain. The travelers who first ventured into the arid interior, however, came from the East and, being accustomed to plenty of rain, naturally reported it to be a desert. The first farmers, also, who attempted to raise crops in the arid area met with many failures.

Explanation of the uneven distribution of rainfall. — Rain, or lack of it, must be accounted for by the direction of the winds, for they are the water carriers of the earth. The prevailing winds for this section blow from the west; and as they cross the Pacific Ocean they gather up immense volumes of water in the form of vapor. As they travel onward over the land they drop this load only when they are compelled to do so. The first land they encounter is a series

Effect of the Coast Ranges on the rainfall

Photo by A. M. Prentiss

Fig. 150. — A scene along the Columbia River Highway

This building, called Vista House, was built to the memory of the pioneers who early settled the Oregon Country. It is a rest house for visitors on the Highway.

of comparatively low mountain ranges, called the Coast Ranges, that extend along most of our western coast. Trace them on the map. The air is forced to rise in order to pass over these mountains; this causes it to become cooler, and as it cools off some of its vapor is condensed and falls in the form of rain or snow. Fig. 18 shows that the winds lose much more moisture along the northern half of the coast than along the southern half. This is chiefly because in the southern half they blow only in winter. Why California has little rain except in winter is explained on p. 236.

Effect of other mountains on the rainfall

As the air descends on the east side of the Coast Ranges it becomes warmer, and there is much less rain. These winds then, after crossing a narrow valley from 50 to 200 miles in width, reach a much higher system of mountains called the Sierra Nevada in California and the Cascade Range in Oregon and Washington. They are here forced to rise much higher than before in order to pass over, and are therefore cooled still further and continue to drop, or *precipitate*, their moisture. For this reason the Pacific slope, particularly the northern half, is well adapted to humid farming and is an area of abundant and varied crops and of immense forests.

Then the air descends on the east side of these mountains and travels onward for hundreds of miles, until it reaches the Rocky Mountains. There are only scattered mountain heights on the vast plateau that it crosses here, and for this reason it now gives up little moisture. But the Rockies are in

many parts fully as high as the Sierra Nevada and the Cascades, with the result that they receive a moderate amount of rainfall as the winds pass over them. This rainfall, however, is not so heavy as that in the coast states, because the winds have already lost a large part of their vapor on their long journey. Yet the fact that it is considerable

Photo by Asahel Curtis

Fig. 151. — Mt. Rainier (Mt. Tacoma)

If we consider net elevation above its base, this is the highest peak in the United States. In basins about the peak are twenty-eight glaciers, covering in all forty-eight square miles. On the lower slopes of the mountain are dense coniferous forests. The district surrounding this peak, which contains some of the most beautiful scenery in America, is a national park. Seen from Tacoma or Seattle, this mountain is an almost perfect cone.

is shown by the number of large rivers that rise in these mountains. What sources of rivers do you find here? What is the rainfall on the mountains in Colorado (Fig. 18)?

The westerlies then pass on beyond the Rockies. As they descend over the Great Plains they constantly become warmer, gathering up moisture instead of letting it fall. This region is therefore semi-arid.

How mining has developed the West. — The discovery of gold in California in 1848 advertised the West as a region where quantities of that metal and perhaps of others might be obtained, and a mad rush of men from all parts of the world to that section followed. The search that was then begun has continued ever since; and many valuable deposits of gold, silver, copper, lead, zinc, and other metals have been discovered.

Abundance of metals in these states

These metals are usually found united with other elements and with rock, the mixture, as in the case of iron (p. 37), being called ore. Considerable *native*, or pure, gold, however, is found in rocks or in gravel washed from the rocks. In some cases hot water has helped to collect the metals along cracks and pockets in the rock, so that they are easier to find than they otherwise might be. For example, there have been many volcanoes in these states; and the water that has passed off from the volcanic rock has often been so hot that it dissolved mineral matter found in its course and carried it along in solution. When the water cooled, it could no longer hold such matter, and so deposited it on the walls of the cracks through which it passed. These deposits are called *veins* of ore; in mines, the tunnels follow these veins.

The men who search for the ores are called *prospectors*. The Government owns much of the Western land, and all ore found upon

government land belongs to the finder. Thus any citizen of the United States may become the owner of a rich mine if he can discover one on government land. In some parts of the West the traveler can see from the car window scores of little tunnels leading into the mountain sides, which have been dug by prospectors. It is a hard, lonely life that such men lead, and most of them get little reward; but occasionally one discovers a vein and becomes a rich man. Many groups of men have formed mining companies with large capital and established valuable mines. As a result, every one of these states is noted for minerals, and mining is one of the leading occupations in all of them.

How the ores are found

The first method of obtaining gold consisted in scooping panfuls of sand, gravel, and water from stream beds and in rotating the pan in such a way that the water and gravel were spilled out. The gold, being several times heavier than the water or the gravel, settled during the process to the bottom of the pan. *Panning*, as this process is called, is the crudest form of *placer* or surface mining. Do you see how the expression "pan out" originated in this method? What does it mean now?

Methods of obtaining the metal

1. How it is obtained from gravel

This method was too slow, however, for extensive operations, and several improvements upon it were soon devised. The *cradle*, or *rocker*, resembling a child's cradle, took the place of the pan. This, also, proved too slow, and ore-bearing gravel was shoveled into steeply sloping troughs, or *sluices*, that had cleats across the bottom. Water was used to carry the gravel over the cleats, and the gold, being so much heavier, settled to the bottom and was caught behind them. Finally powerful streams of water from hose or pipes were directed against banks of gold-bearing gravel, which was washed directly

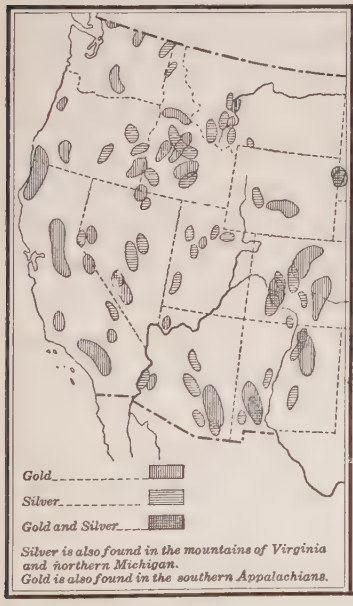

Gold
Silver
Gold and Silver
Silver is also found in the mountains of Virginia and northern Michigan.
Gold is also found in the southern Appalachians.

Fig. 152

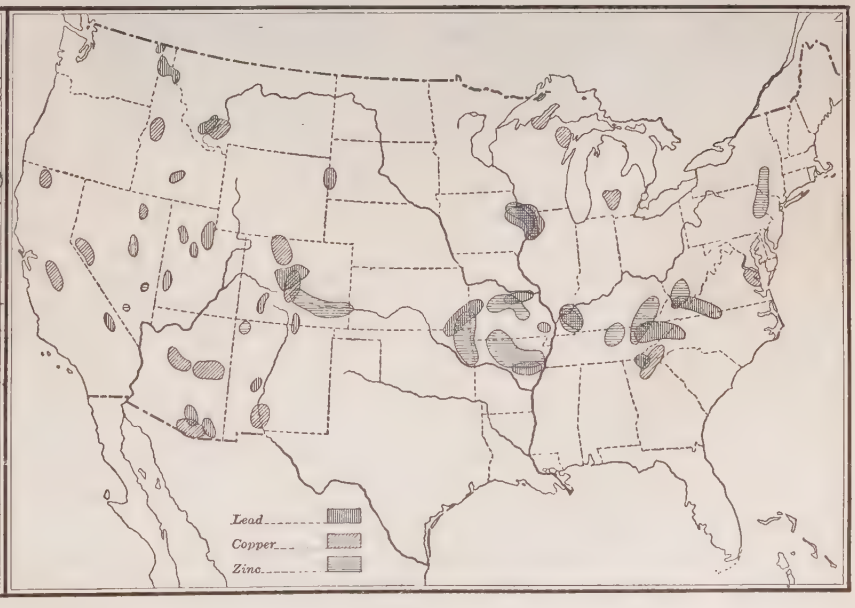


Fig. 153

Note the fact that the most valuable deposits of the precious metals are found in the Western States. Of the five metals shown, which is most widely distributed?

into the sluices. This is called *hydraulic* mining. The gravel from which some of the streets of Helena, Montana, are built was washed for gold in this manner. The abundance of water in many sections, especially among the mountains, favored this method.

The richer discoveries of gold-bearing gravel were soon exhausted, however, and it became necessary to wash gravels of lower grade. For this purpose floating *dredges* are now in use in many places, especially in California, where the streams emerge from the mountains into the interior valley. These scoop up great quantities of gravel with heavy machinery and wash it very thoroughly.

© Detroit Publishing Co.

Fig. 154. — The Bell Mine in Butte

Butte is one of the greatest copper centers in the world. While copper is the chief ore mined there, silver, lead, gold, and zinc ores are also found. The prosperity of Butte, like that of all copper-mining centers, varies with the demand for its product.

The gold obtained in gravel banks probably came originally from veins of ore. At the present time most metals are found by digging into solid rock for such veins. This is called *drift* mining. The general plan of a gold mine of this type resembles that of the coal mine represented in Fig. 23.

2. How it is obtained from veins

Since the tunnels that are dug following the veins may be hundreds of feet below the surface of the ground, their walls are subject to intense pressure from above. On that account they are in danger of caving in or of having heavy rocks fall from their roofs. To overcome these dangers, powerful timbers in an upright position line both sides of the tunnels and support crosspieces overhead. A single mine frequently contains miles of such tunnels, and thus requires an enormous amount of timber.

Dependence of certain cities upon mining

1. Of cities where mining is carried on

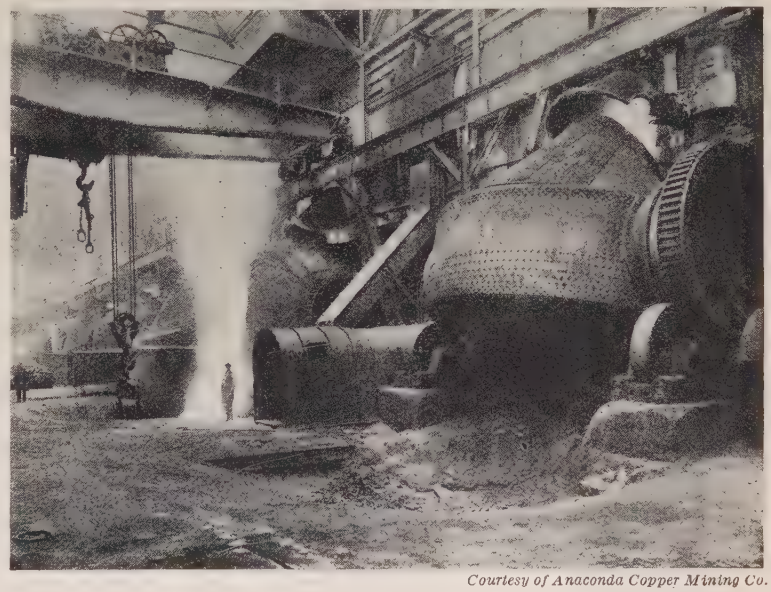
With such an abundance of valuable ores, it is not surprising that many of the towns and cities in the West are chiefly interested in mining. By comparing Fig. 153 with the map (Fig. 175), you can see what metals are found in or near important towns. One of the best examples of such a community is Butte, Montana. Its principal metal is copper, although Fig. 153 shows that other metals are obtained in that vicinity. Many of the mines lie beneath the city itself, and others are close by, so that thousands of men living there work underground every day. The transportation of the ore to the cities where it is smelted gives employment to hundreds of others. Still others help to provide the timber and machinery used in the mines, and the food and clothing required by the miners and their

families. In Arizona, Bisbee, near the Mexican border, is another mining center, the Copper Queen mine there being one of the largest copper mines in the world. Bingham, Utah, is another. Leadville and Cripple Creek in Colorado are still others; and there are many more. What metals, according to Fig. 153, are mined near the two places last named?

Other cities more remote from the actual mines are centers for refining the ores. In some cases the metals are extracted by crushing the ores in mills, called *stamp mills*, and then using chemicals. In other cases the ores are dumped into blast furnaces and the metals extracted by *smelting*.

2. Of cities where ore is refined or supplies are obtained

Anaconda, twenty-seven miles from Butte, has the largest copper smelter in the world, and smelting is its chief industry. Denver and Pueblo are two others. The ores are hauled to these cities, which are also trade centers for the mining districts. Name five metals that are obtained from the mountains near these cities. Great Falls, Montana, is a similar center. So also is Salt Lake City, for an unusual variety of mineral products is mined in its vicinity, the output of copper being especially valuable. What metals are mined in the vicinity of each of these cities?



Courtesy of Anaconda Copper Mining Co.

Fig. 155. — The interior of a great copper smelter at Anaconda, Montana

Native copper like that obtained in the Lake Superior region is easily prepared for market, but if copper is united with sulphur, iron, arsenic, and other substances the pure copper is difficult to obtain and the ore must pass through a long and complicated process. Ore of the latter kind is common in our Western States.

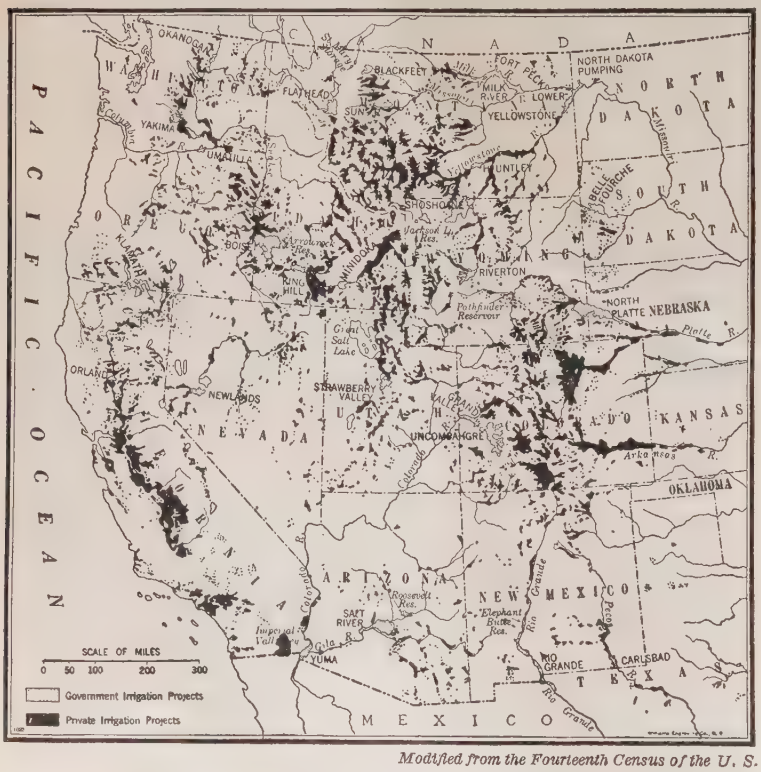
The dependence of the West upon irrigation. — Mining and the refining of ores could not flourish as they do, if a large amount of food were not produced in the West. On the other hand, agriculture could not have flourished as it has if the extensive exploration of this section for mineral wealth had not shown its varied possibilities for food production. Men soon discovered that the West is divided naturally into land regions that are very distinct from one another, each of which is peculiarly fitted for certain human occupations (Fig. 157).

How a study of the land regions reveals the need for irrigation

The Great Plains region, already described on p. 69, is a high, semi-arid plateau well suited to grazing but not suitable for agriculture except when special methods are used to save moisture. Beyond this region, from New Mexico northward to the Canadian boundary, is the Rocky Mountain region, where the rainfall is in places sufficient, but the land too rough, for agricul-

ture. Both mining and grazing, however, flourish here. Still farther west is the great arid area, divided, as the map shows, into three fairly distinct plateaus. Name them. Here agriculture is usually impossible without irrigation. Next we find a narrow belt of lofty mountains, well watered and densely forested. Name it. Beyond these mountains, occupying at least some portion of each of the three Pacific coast states, are long strips of very fertile lowland. That which extends southward from Puget Sound receives abundant rainfall and is level enough for cultivation, but lacks the summer heat necessary for certain important crops; the Valley of California is, on the other hand, extremely productive, yet in general requires irrigation because of the lack of summer rains. The Coast Ranges, which lie beyond, are well watered except in the extreme south. Their principal product is lumber.

The actual area available for agriculture by ordinary methods is very small indeed, for in regions that have sufficient rainfall the surface is usually too uneven. The necessity for using more than this small fraction of the surface of these states thus gave rise to a serious problem. The chief solution is *irrigation*, which has made it possible to grow an astonishing variety of food products in this section.



Modified from the Fourteenth Census of the U. S.

Fig. 156.—The irrigated areas in the West, 1920

Compare this map with Fig. 18 to see why irrigation is necessary in these areas. The entire area of irrigation projects is shaded, even though water is not yet applied to their whole extent.

How irrigation projects are planned

Many of the irrigated districts have been planned and controlled by individuals or private corporations; but since 1902 the United States Government has taken a very active part in establishing irrigation systems. It has, in general, handled the more difficult projects; for most of the land that could be brought under irrigation easily and cheaply had already been taken up privately.

Extent of irrigation in the West

There are now about thirty government irrigation projects in the West, including the arid portion of the Middle West. Fig. 156 shows how these are distributed. Some are far east of the Rockies on the Great Plains, as, for example, the North Platte Project in Nebraska. Others are in the mountain valleys and on the plateaus. Two adjoin Mexico,

and several are near the Canadian boundary.

The same figure shows the relative area of irrigated lands due to private enterprise. How does this amount compare with that made available by the government?

California leads in the quantity of irrigated land, having over 4,000,000 acres. Colorado is second and Idaho third. All together the irrigated lands include over 19,000,000 acres. How many square miles is that? You can compute for yourself what a small fraction it is of the entire area of these states.

While the portion is small, it should be kept in mind that irrigated land is much more productive than ordinary land. Irrigated fields are much more intensively cultivated than others. They are expensive to start with, but every square foot can be well watered, and farmers therefore plan to get the fullest possible returns. The yield per acre is more valuable than that of any other farm land in our country.

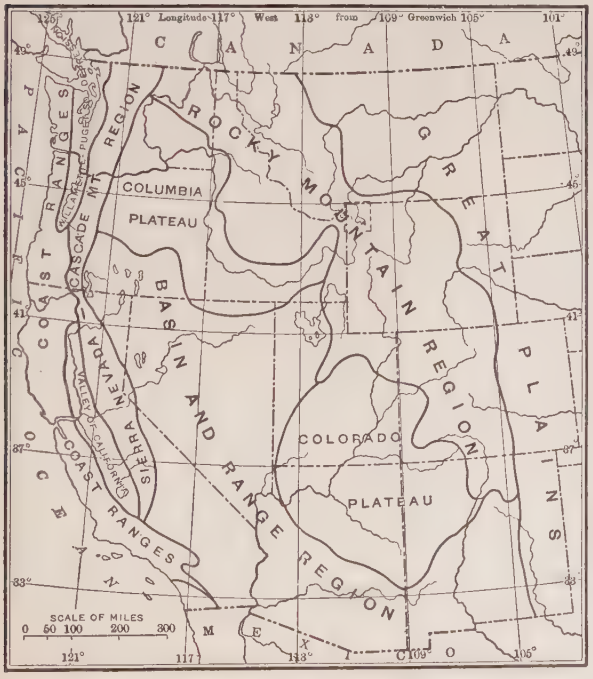


Fig. 157. — Land regions of the Western States

Courtesy of U. S. Reclamation Service

Fig. 158. — An orchard in blossom in the Grand River Valley Project

This irrigated region is famous for its apples and peaches. One can see in this picture how carefully the orchards are cared for. The row of iron boxes on the right are smudge boxes used for making a dense cloud of smoke to protect the orchard from frosts.

How our government undertakes irrigation is illustrated by the Minidoka Project in south central Idaho along the Snake River (Fig. 159). The Snake River rises in the mountains of western Wyoming and eastern Idaho and flows southwestward and then northwestward to the Columbia River. The high Teton Range in western Wyoming, the most important mountains at the headwaters, receives heavy snows and rains; and the many glaciers, mountain lakes, and forests in this region tend to regulate the flow of water so that it is reasonably uniform throughout the year. After leaving the mountains the river flows through a plain that slopes gently on both sides toward the stream.

A typical irrigation project

1. Its source of water

The soil is extremely fertile, some of it consisting of broken up, or *decomposed*, lava. There are numerous falls in the rivers and at places deep canyons. The sky in general is clear, the air bracing, and the region healthful. This plain is a promising location, therefore, for an irrigation project.

One of the first things to be done was to make a survey of the river sources to determine how much water would be available if the spring floods could be stored. Another survey was made to find how much land in the valley could be reached through irrigation, for it was necessary that the land should lie at such a level that water from the main stream, above the dam, could be run over it with the least possible amount of pumping. It was learned that there were at least 200,000 acres with a suitable surface and that enough water would be available to irrigate at least 120,000. How long is the irrigated tract as shown on the map? How wide? How does such an amount of land compare in area with Rhode Island?

2. Objects of preliminary surveys

Next a site was selected for a dam. The place chosen was a narrow gorge where the river had cut through the lava deposits; and the dam was built so strong and high that it could hold back practically all the spring floods until such times as the water would be needed on the plains below. Such dams are known as *storage*, *diversion*, and *power* dams; for they store water for the dry season, divert the water from the artificial lakes they have formed into canals that run to the irrigated land, and provide falling water with which to generate electricity for power, heat, and light. A small portion of the chief artificial lake thus created on the Minidoka Project is shown in Fig. 159.

3. The plan of construction

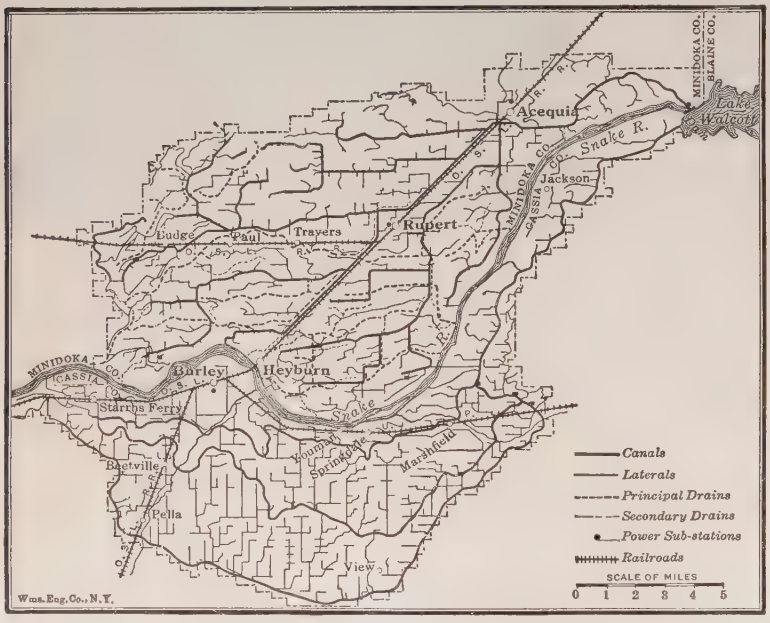


Fig. 159. — The Minidoka Irrigation Project

Locate this area on Fig. 156. Compare the scales used in these two maps.

From this lake two canal systems run, one on either side of the river, over the irrigated land. The main canals, as the map shows, border the valley on either side; water runs from these into smaller canals and again into still smaller canals or ditches, so that all the land may be reached by the water. There are more than 600 miles of canals in this project. Some of the land cannot be reached by the gravity system of canals that run directly from the diversion dam, so pumping stations have to be provided. These are run by electricity generated at the diversion dam.

Water that is distributed over the land

disappears or is used up in many ways. Some evaporates, for evaporation is rapid in most portions of the West in summer because the air is very warm and dry. Much water is taken up by the plants and is used in the formation of plant tissues. Some water sinks into the ground beyond the reach of the plant roots, and its value is lost to the farmer. An important problem for the irrigation farmer is to utilize as much of the water for plant growth as possible.

4. The distribution of the water

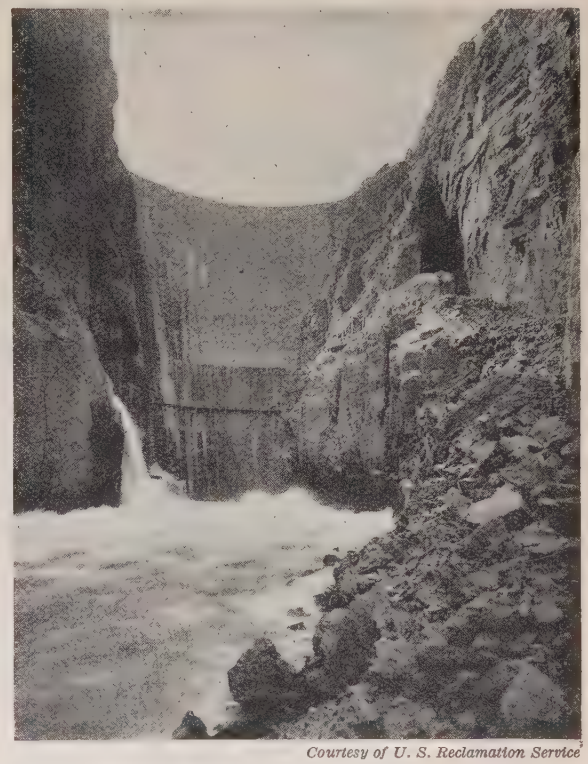
Life here is decidedly different from life in humid regions. Living conditions are much the same for all the families. No one is very poor, and all have good homes. Furthermore, being so shut off from the surrounding territory and so closely associated in many ways, they are more neighborly than usual and meet often to discuss common problems. Clubs and other organizations flourish; and, understanding the value of coöperation, the people have good roads, good schools, and other comforts and amusements. The cheap electricity generated by the water as it flows from the diversion dam enables every home to have electric lights and electrical devices of many sorts.

5. The unusual life of this community

The usual size of the farms on the Minidoka Project is forty acres. Scarcely anyone has more than 160 acres, partly because large landowners, who might monopolize the benefits of irrigation, are not wanted; and partly because one family cannot usually cultivate a large acreage successfully. Agriculture is here intensive. The cost of the land without water rights is in some cases as high as fifty to seventy-five dollars per acre, and the yearly cost for water is from one to three dollars per acre. When improvements are made in the land, however, in the shape of buildings and orchards, its value becomes $200 to $500 or more per acre.

6. Agriculture on the irrigated land

The high value of the land and the great distance to markets force the farmers to get as much out of the soil as they can.



Courtesy of U. S. Reclamation Service

Fig. 160. — Shoshone Dam across the Shoshone River, Wyoming

This dam is a part of the engineering works connected with the Shoshone Irrigation Project. The dam is built in a narrow canyon of the river. It is 328 feet high and only 200 feet long at the top. A lake with an area of more than ten square miles is formed behind the dam, large enough to supply water to 150,000 acres of land. Locate this project on Fig. 156.

They have the advantage of farmers in humid regions in that they can give their crops water whenever they need it. Alfalfa and sugar beets are among the chief crops; and these form the basis of the dairy industry. Potatoes, clover seed, and some grains and fruits, especially apples, are also raised.

The Minidoka Project cost our government about $6,607,000. This cost was paid by the people who purchased the land. About how much would that be for each of the 120,000 acres in the project? What benefits have come from the expenditure of this money?

7. Cost of the project

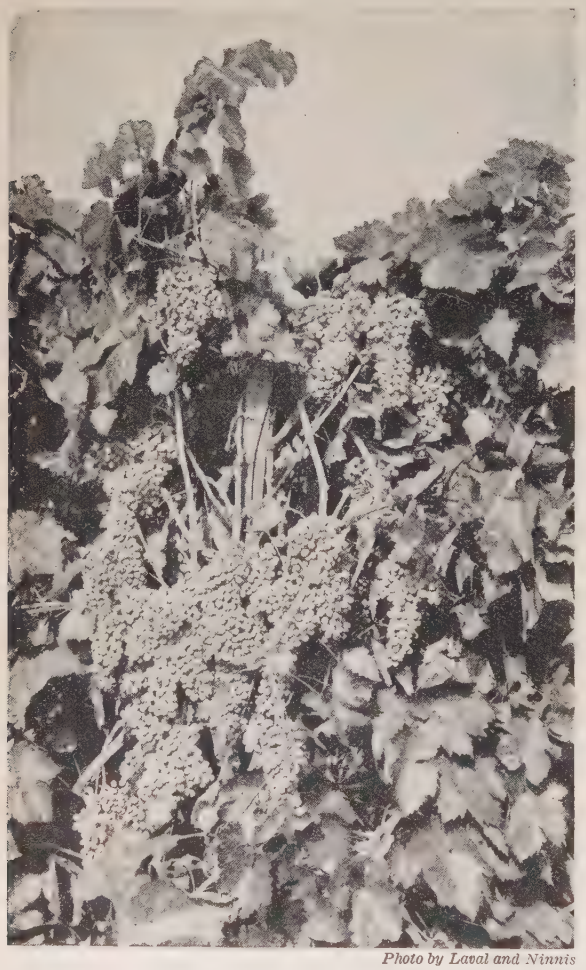


Photo by Laval and Ninnis

Fig. 161. — Raisin grapes grown in California

California is the only state producing large quantities of raisins. Many kinds are grown, some with seeds and others without. Most of the raisin grapes with seeds are now seeded in large plants with specially constructed machinery. Why is the climate of California ideal for drying fruit?

Fig. 18 shows what a large part of California lacks sufficient rainfall for agriculture; yet irrigation has wrought wonderful changes in that state. Owing to the westerly winds in winter from the Pacific, the temperatures are moderate, and many of the crops grown in Florida are grown here also. The Valley of California (Fig. 157), drained by the Sacramento and the San Joaquin rivers, is noted for its agriculture. It is a remarkably fertile, level region about 400 miles long. Estimate its average width and compare its area with that of some of the Northeastern States.

The extent and variety of crops raised by irrigation

1. In the Valley of California

Before irrigation was introduced, wheat was the principal product, and at one time California was our leading wheat state. Now there is a large variety of crops, many of which are grown by irrigation. All the common grains are raised; a great amount of hay, potatoes, and other vegetables; and a large quantity of sugar beets. Almost all kinds of fruit flourish here, particularly grapes, peaches, apricots, oranges, plums, prunes, apples, cherries, and figs. A larger area is given to the raisin grape than anywhere else in the world, and most of the olives grown in the United States come from this valley. Rice culture is extensively carried on in the Sacramento Valley (p. 108); this is already so important as to compete with rice imported from Japan.

Fig. 156 shows how much of this valley is now irrigated. There is abundant water from wells and from mountain streams for other irrigation projects; and as their number grows the population of the valley will greatly increase. Note the cities located in it.

2. In southern California

Thousands of persons were first attracted to southern California by the climate; then, seeing the opportunity of raising fruit, they planted orchards. About two thirds of the oranges

and almost all the lemons grown in the United States come from southern and central California. Many grapefruit also are grown. Among other products are olives, almonds, English walnuts, and grapes. Nearly every home about Los Angeles has its fruit trees, and in many cases the houses are surrounded by them.

In the extreme southeastern part of the state is the irrigated district known as the Imperial Valley. In 1900 this was waste land; but by means of water from the Colorado River about $70,000,000 worth of products was taken from it in 1920. Already 600,000 acres are under cultivation and plans are under way for supplying water to half as many more.

One of the new crops here and also in Arizona is "long staple" cotton, which is especially useful in the manufacture of automobile tires. The value of this one crop in 1920 was $23,000,000, which, though only one twentieth of the value of Texas cotton, suggests that the irrigated lands in California and Arizona may figure prominently in cotton production (p. 101). Other leading products in the Imperial Valley are cantaloupes, barley, and live stock.

Courtesy of California Fruit Growers' Assn.

Fig. 162. — Picking oranges in an irrigated orchard in California

The oranges are cut from the trees with clippers. They are never pulled, and the pickers wear gloves to avoid scratching the fruit. Care is also taken to avoid bruising the oranges. See if you can find an advertisement of California oranges. What claim is made for the fruit?

Denver and Salt Lake City owe their importance as centers for surrounding mining districts partly to the abundant vegetation in their vicinity, made possible by irrigation. Note in Fig. 156 how extensive are the irrigation systems near these cities. The high altitude of these sections and their continental climate prevent the cultivation of subtropical fruits; but many kinds of vegetables can be raised, in addition to many of the fruits raised in California. These districts likewise produce a large amount of grain and forage crops.

3. About Denver and Salt Lake City

Irrigation is just as extensive in the northern as in the southern states of this group except along the Pacific watershed, where, because of the ample rainfall, it is not needed. Note how much there is in Montana, especially along the upper Missouri River (Fig. 156). One of the most noted irrigated sections is the Yakima Valley, just east of the Cascade Mountains in Washington. It is famous for its apples, peaches, and pears, which are sold in almost every grocery store in the East. Some of the advantages for fruit in the West are that the

4. In the Northwest

dry climate checks the development of insect pests; the isolation of the irrigation projects makes it easy to prevent their spread; and the absence of wet spells prevents the ripe fruit from rotting on the trees. Orchards in this region are sold for from $500 to $1,500 per acre, which is a price rarely reached for even the best farm lands outside of irrigated areas.

In Fig. 156 note how many other irrigated areas are found along the Columbia River and its tributaries in Idaho, Oregon, and Washington. Like the Yakima Valley, they grow great quantities of fruit, alfalfa, and other forage crops.

Fig. 163. — The Mormon Temple and Tabernacle, Salt Lake City

The Mormons migrated to Utah about 1846. By irrigation, they have made the arid region west of the Wasatch Mountains one of the most productive in our country. The Temple, in the foreground, is one of the most beautiful churches in America. The tortoise-shaped building in the center of the picture is the Tabernacle, famous for its great organ.

About the time of the discovery of America sugar was sold in London for as much as $2.75 per pound; and since a laborer's wages were then only a few cents a day we may be sure that he did not buy much of it. Now it is considered a necessity for everybody. The most prosperous nations use the largest amount, so that one way of judging the wealth of a country is by the quantity of sugar it consumes. England, for instance, consumes twelve times as much per person as Italy.

How a new farm industry has developed through irrigation

1. Some steps in the use of beets for sugar

For a long time the principal source of sugar was cane; no one thought of using beets for that purpose. Finally, however, chemists discovered that beets contained sugar. During a shortage of sugar in France, a prize was offered to any one who would make sugar out of materials produced in that country. Chemists went to work on the problem and were soon manufacturing sugar from beets. When the shortage was over, however, cane sugar was again used and sugar beets were neglected.

Yet they were not forgotten. There had been two obstacles in the way of their use. The beets that were raised at that time were not very sweet; and only a small part of their sugar could be extracted. Scientists have kept at work on these two problems ever since, with remarkable results. They have so improved the beet that some beets yield one sixth of their weight of sugar; such beets are even sweeter than sugar cane. Methods of manufacture have also been discovered by which nearly all the sugar can be extracted.

With these improvements the sugar beet has come more and more into use, until it furnishes more than a third of the world's supply of sugar. We import a large part of what we use, but we now produce several times as much beet sugar as cane sugar. While the two kinds are so alike that you can scarcely distinguish between them, they are

obtained in very different ways. You know the climate necessary for sugar cane, and how the cane is raised (p. 106). Let us consider what climate is best for beets, and the method of raising them.

2. How sugar-beet farming is carried on

a. Temperature conditions required

The temperature conditions required for sugar beets are suggested by comparing Fig. 117 with Fig. 12. The leading state in the production of beet sugar is Colorado. California ranks second. What other states are prominent in this industry? Note that Michigan is the only important sugar-beet state outside the arid area. In what temperature regions are these states? How, then, does the temperature permitting the growth of sugar beets differ from that required for sugar cane? They thrive best not only in a cool climate, but where they can have plenty of water in the spring and early summer with dry weather in August and September. Bright sunshine helps greatly to form the sugar.

b. Methods of beet culture in a typical sugar-beet district

The valley of the Arkansas River in eastern Colorado is a typical sugar-beet district. The principal rains come in the spring and early summer, as desired, and the sun shines nearly every day in August and September. Since less than twenty inches of rain falls each year, irrigation is necessary, and the fact that the land is almost perfectly level makes the application of water easy. Ditches lead from the river to the fields; but the farmers depend upon wells for water when the river is low. Beets require a great deal of water while they are growing.

The farms are small, many of them containing only forty acres in beets; but that is all that one man can cultivate with a team of horses. The ground is prepared as early in the spring as possible; and the seed is planted in double rows about two feet apart. Beet seed frequently fails to germinate well, so it is planted very thick. Soon after the young beets are up they must be thinned, which is a tedious task. These young beets look so much like little weeds that the work must be done with great care, and there is no substitute for human fingers. Hoeing and weeding must be continued throughout the summer.

Harvest time comes just before frost, when the beets are fully matured. They are dug by a machine that throws them out on the ground, but they must be picked up and loaded by hand. The factory contracts for

Courtesy of U. S. Reclamation Service

Fig. 164. — Irrigating sugar beets in Colorado

The beets are planted in double rows, separated by furrows from twenty to twenty-four inches wide. The furrows lead off from a large ditch into which water for irrigating the field is led.

the full crop at a certain price per ton even before the beets are planted; and at harvest time they are hauled to it in wagons, which are dumped by machinery. Many farmers sell the beet tops for cattle feed. Others have herds of their own, to which they feed the tops during the fall and early winter. After that they feed them beet pulp from

the factory, *i.e.*, the part of the beet that is left after the sugar has been extracted.

The success of dry farming. — In spite of the wonderful success of irrigation in the West, only a small percentage of the arid land is farmed by its help (Fig. 156); an enormous area is still unused. Much of this is too rocky and mountainous ever to be cultivated, and parts of the rest are too dry even for *dry farming*. Water is necessary for this type of agriculture, just as for any other, in spite of the name; it is called dry farming only because it requires less than the usual amount. It can hardly succeed where the rainfall is less than ten or twelve inches, and a rainfall of fifteen or more inches is desirable.

Where dry farming is possible

Fig. 18 shows how large an area receives from ten to twenty inches. In a large portion of this area dry farming is possible. In which states would you expect it to be most extensive?

The West at first proved to be a very deceptive farming country. Some of the land receives its principal rains in the spring, when flowers bloom gayly, the grass is green, and song birds are many. The deep, fertile soil invites the plow; and now and then, even through several years at a time, there is plenty of rain during the growing season.

Hardships endured in learning to farm such land

About 1880 people began to migrate to the dry lands east of the Rocky Mountains in large numbers; and finding these favorable conditions in many sections, they became enthusiastic settlers. Then came years of drought and disaster. The short growing season in the spring was followed by hot winds that dried up every green thing. People lost everything they had. Many towns were entirely abandoned, and even whole counties were left almost without inhabitants.

The selection of crops

All this time the most observant settlers were learning. They studied the climate, the soil, and the crops suited to both; and they were greatly aided by the experiment stations of the national and the state governments. In time a new system of farming was developed, which is now called dry farming. To use this method with success, it is necessary to select crops that can withstand drought. Some plants store up moisture during wet weather, just as some animals store up fat in summer; and this lasts them through a long dry period. Some stop growing and live in a dormant condition during a dry spell, just as bears and woodchucks hibernate, and when rain comes they begin to grow again. Others close up their pores so that the moisture within them cannot evaporate; and still others have leaves that expose very little surface to the sun, or roots that reach an astonishing distance down into the earth in search of moisture.

1. Types of vegetation suited to dry farming

Many parts of the earth were searched to find crops that were adapted to a dry climate. One of the most valuable of these is *alfalfa*. Its roots extend many feet down into the earth, and thus protect it against any ordinary drought. Millions of acres of it are now grown, both under irrigation and by means of dry farming. *Sorghums* are also very valuable, for they have the power to close their pores and to cease growing during a dry spell. There are several varieties, as, for example, sweet sorghums, broom corn, and kafir corn. These all have broad leaves and bushy tops and look like small sugar cane. The dried stalks make excellent fodder and the grain of some is nearly as valuable a

2. Plants that meet these requirements

food as corn or oats. There are millions of acres of sorghum in the West. There is also a certain kind of winter wheat that is well adapted to arid lands. It is sown in the fall, grows rapidly during the spring rains, and matures before the drought is severe. The long dry period that follows is just what is wanted for harvesting and threshing. A large amount of wheat is thus raised and forms the chief dry-farm crop in many districts, especially in eastern Washington. The methods pursued by the owner of the wheat farm described on pp. 66–68 were in many respects similar to dry-farming methods. Certain kinds of beans are raised extensively by dry farming. Various kinds of grasses, also, such as Sudan grass from Africa, are being tested at experiment stations; some of these promise to become very valuable.

for in an arid country it tends to be especially rapid. Experiments have been made showing that on the Great Plains as much as sixty inches of water will evaporate in a year, while in the Northeastern States the amount averages only twenty-five inches. The cooler temperatures in the states bordering on Canada give them an advantage in this respect over the others, but all the arid lands suffer seriously

Photo by Gifford

Fig. 165. — A combined harvester at work in a wheat field of the Northwest

This machine is so large that a great many horses are required to pull it and operate the machinery. Merely the heads of the wheat are cut. The machine threshes these heads, the grain being caught in sacks and tied. The straw is later "plowed under" to enrich the soil.

Method of cultivating the soil

Besides finding suitable plants, it was necessary to learn how to cultivate the soil so as to make most use of its moisture. It was found to be necessary to keep down all weeds, for they take up water rapidly. Another requirement is to make the ground so mellow by deep plowing and pulverizing that it will absorb all the rain that falls, instead of allowing a considerable portion of it to run off. The next thing is to hold the moisture there. Much of the water that sinks into the soil soon begins to creep back to the surface again and evaporate. It is important to check such evaporation as fully as possible,

1. How the moisture is preserved

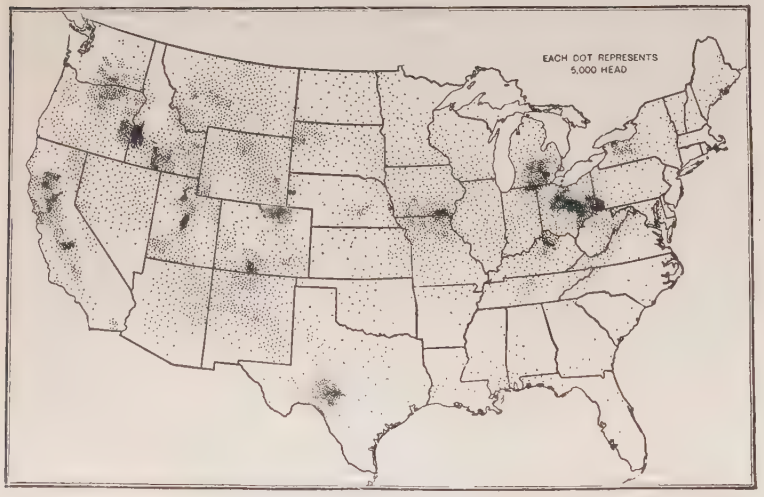
from evaporation unless it is carefully checked.

When the surface soil is allowed to harden, small tube-like openings are found in it extending upward, which conduct the moisture rapidly to the air; but if the surface is cultivated or harrowed so as to form a top layer of fine dirt, or *dust mulch*, such openings are prevented from forming and the escape of moisture is greatly checked. The farmer, therefore, must cultivate and harrow his fields frequently. In that way they can

be kept green with crops all summer, while surrounding fields not so treated are burned brown and bare.

In some localities the rains are not sufficient to produce a good crop every year even when such precautions are observed. In that case farmers resort to the device of saving up the moisture of two years in order to produce one crop. For example, in some parts of eastern Washington, near Spokane, where wheat is the chief crop, the farmer plows his ground in the fall as if he intended to sow wheat; and then during the following year he keeps the top soil well stirred, so that it will absorb all the rain and permit very little evaporation. The second fall he sows wheat, and the following summer he has a fine crop.

2. Special methods where rainfall is insufficient for annual crops



From the 1921 Yearbook of the Department of Agriculture

Fig. 166. — Sheep, 1920

Extent and methods of grazing. — The extent of cattle raising in the West is shown in Fig. 73. How do cattle compare in number here with those in other parts of the country? They often graze a part of the year in the buffalo grass found in the arid lands, and during the rest of the year are fed alfalfa and other forage crops grown by dry farming or irrigation. The old custom of herding vast numbers of cattle on the government *ranges*, which had no fences and were free to everybody, has largely disappeared, and now most herds are fenced in on private land. Even the privately owned ranches, however, are on the average much larger than the farms in the North Central States, and herds of thousands of cattle are not uncommon.

Of cattle ranching

That the West is especially adapted to sheep is indicated in Fig. 166. One reason why they thrive there is the fact that they bite off the grass very close to the roots and thus often find nourishment where cattle would starve. Sheep are thus raised extensively not only in the Great Plains region but also in the Rocky Mountain region and the three plateau regions farther west. The great extent of this industry is shown by the fact that sheep are raised in large numbers as far south as New Mexico and as far west as eastern Washington and Oregon. A good-sized sheep ranch in Wyoming or Montana has from 25,000 to 40,000 head of sheep. These may feed partly upon government land, or the range, and partly on land owned by the ranchman. During the coldest winter weather, when the snow may be so deep that the sheep cannot obtain food, they are often driven into protected *corrals* and fed on alfalfa. The fierce winds of the open plains help them, however, by drifting the snow and thus leaving open patches where they can find grass; so also do the warming

Of sheep ranching

1. Method of herding

Chinook winds (named from the Chinook Indians), which sweep down from the mountains and melt even heavy falls of snow with astonishing rapidity (p. 184).

When the sheep are feeding on the range, one man with dogs can herd 2,500; if he has a horse to ride, he sometimes takes care of 5,000. Selecting a spot near water for a camp, the herder drives his sheep out each morning and back at night, going each day a distance of two or three miles from camp. When the grass is eaten in one place, the camp is moved; then, from the new point as a center, they wander out as before. When the supply of water is sufficient to permit frequent camping places, camp is moved almost every day to keep the sheep always in fresh pasture.

© *Press Illustrating Service*

Fig. 167. — Sheep grazing in Wyoming

From the appearance of the landscape in this view, do you think these sheep are grazing on privately owned land or on the open range? What indications are there that this land is semi-arid, and therefore unsuitable for ordinary agriculture?

The life of the herder is extremely lonely, both day and night being spent with the sheep. Once a week, perhaps, a man brings him food; and for weeks and even months at a time the only company he has, aside from his sheep, is his dogs and possibly a horse.

After the winter is over, the first income to the ranchman comes from the sale of the skins, or *pelts*, of sheep which have died during the cold weather. He expects to lose about one sheep in twenty each year from this cause (p. 219).

2. The sources of income from sheep

The next payment comes from the wool. Men who make it their business to shear sheep travel in squads. They erect sheds and pens near some sheep center, such as Billings, Montana, and shear all the sheep that are brought to them. Sometimes sheep are sheared at the ranch, but many ranchmen prefer to drive them to a market before they are sheared. In the southeastern states of this group, sheep are often sheared twice a year; but farther north it is done only once, as near the month of June as possible. Can you suggest a reason for choosing that time? After the wool is cut, it is pressed into bales and shipped to various markets in the East. Where would you think it might be sent, and for what purposes used?

From July on, many sheep are sold for mutton. Those that are from three to five years old, and have already borne a quantity of wool, are usually selected for this purpose. The hides are useful for leather and the bones for fertilizing the soil.

Advantages for manufacturing in the West. — The agricultural products of the

© Brown Bros.

Fig. 168. — Prune orchards in blossom, Santa Clara Valley, California
This exceedingly fertile valley is located just southeast of San Francisco Bay (Fig. 183).

arid area, like the minerals (p. 135), lead to a large amount of transportation and manufacturing. Many of the fruits are carefully packed and shipped fresh by rail to the large Eastern cities. The general use of refrigerator cars makes it possible to ship immense quantities of fresh fruit without danger of spoiling. Name some such fruits and also the localities from which you would expect them to come. The preparation for the market of such fruits as are not shipped fresh is really a type of manufacturing. Immense quantities of peaches, prunes, apricots, apples, grapes, and figs are dried, mainly by exposure to the sun. The rainless summers of California are especially favorable to this industry. In humid regions fruit soon decays if left out of doors; but in the sunny climate of that state it quickly dries. Most of the raisins consumed in our country are raised and dried in California, Fresno being the chief center for raisins. From what districts would you expect the other dried fruits to come? In addition, the canning and preserving of fruit is a very extensive industry, not only in California, but also in the Pacific Northwest, where the production of fruits greatly exceeds the amount locally consumed.

Influence of agriculture and grazing on manufacturing and transportation

1. In the preservation of perishable fruits

The abundance of alfalfa, with which to feed dairy cattle, has made it possible to

establish many creameries, and the abundance of sugar beets has caused the erection of many sugar refineries. In which states would you expect such factories to exist? The great number of cattle and sheep has given rise to slaughterhouses and meat-packing establishments in the leading towns and cities, and the great quantity of wheat to many flour mills. Spokane, for example, on account of the nearness of an important wheat region and its cheap power from waterfalls in the river that flows through the city is an important center for flour. Portland, Oregon, is also an important milling center.

2. In the establishment of large factories for food products

Thus we see that a considerable portion of the manufacturing in the West consists of the refinement or the preservation of its agricultural products, many of which are perishable. On the other hand, much of the manufacturing in the West is like that of the East. Articles that are easily made, or that are so bulky or heavy that their transportation for a long distance would be very expensive, are manufactured in so far as possible near where they are used. Thus, as we have seen, the milling of flour is a common industry both here and in the East; so also is the production of lumber, of meat, of mining machinery, and of many household and farm implements. The abundance of lumber in the Northwest gives rise to an extensive shipbuilding industry, and the cities on San Francisco Bay are engaged in important iron and steel manufactures and in the refining of oil (see p. 150).

How the manufacturing of the West compares with that of the East

Yet there is a marked difference in the character of the manufactures of the two sections as well as in their quantity. The metals obtained from the West — for example, the zinc, lead, copper, and silver — are to a large extent sent to the East, where they are made up into a host of articles that command high prices. So also is a large part of the lumber, hides, and wool. The metals may be made into clocks, the lumber into furniture, the hides into shoes, and the wool into clothing. As a rule, the first stages in the use of these materials, which require only the simpler processes, take place in the West; while the more advanced forms of manufacturing are left to the more highly specialized skill of the Eastern workers.

In some important kinds of manufacturing, however, the West surpasses all other parts of the country. For example, the sunshine, the mild temperatures, and the varied and beautiful natural scenery of the neighborhood of Los Angeles favor the

Special types of manufacturing in the West

Photo by A. M. Prentiss

Fig. 169. — Inside view of a cannery at Astoria, Oregon

Fig. 170. — A motion picture

The group of buildings on the left includes dressing rooms, indoor stages, property houses,

extensive production of motion pictures, which is now one of the leading industries of southern California. In 1920 there were fifty-five motion picture companies in Los Angeles, producing seventy-five per cent of the pictures made in the United States.

Abundance of power in the West. — The West is abundantly supplied with power for all types of manufacturing. Fig. 4 tells you how widely distributed the coal beds are. Name the states that have the largest. While California has very little coal, it has an excellent substitute, for it is the leading oil state, having Oklahoma as a close rival in the production of petroleum. This is so abundant that it is used on steamships and locomotives in the West as well as in factories. In Fig. 30 note its location. Water power, likewise, is plentiful in the mountains. On account of the heavy rains and the ruggedness of the country, there is more power in the streams of the Pacific coast states than in those of any other section of equal area in the United States. There is a vast amount in the Rocky Mountains, also. Many of the streams come from ice fields in the mountains, where the melting in summer balances the lack of rain during that season, so that the flow of water is kept fairly uniform throughout the year.

The sources of power

Courtesy of Denver & Rio Grande System

Fig. 171. — Through the Rocky Mountains in Colorado

Note the two tracks, one on each side of the stream.

Not only does the West thus possess an abundance of water power superior to that

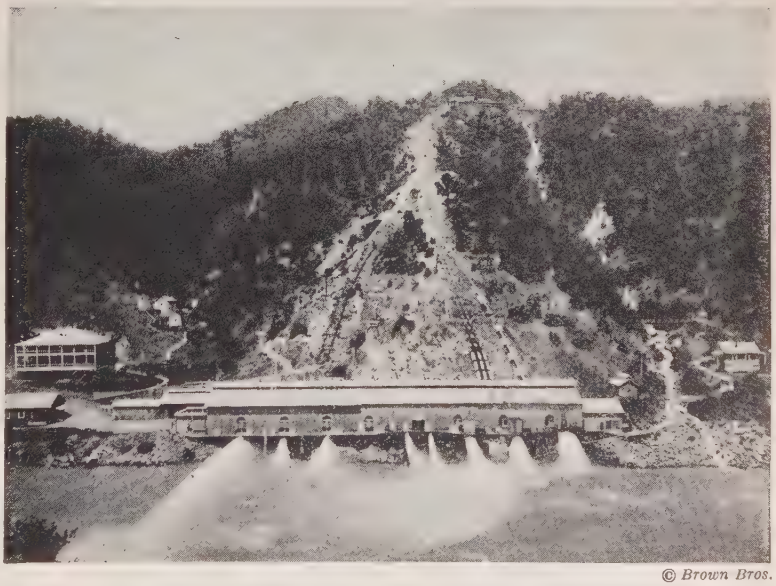
Photo by J. Mingo

studio in southern California

workshops, laboratories, and offices. On the right are shown outdoor sets and street scenes.

in any other section of the United States, but it has learned to make fuller use of it than is commonly done elsewhere. Buffalo (p. 34) and St. Louis (p. 73) are exceptional among Eastern and Middle Western cities in the extent to which they depend upon electricity for power. On the other hand, there is scarcely a large Western city that does not make very extensive use of the cheap power which is everywhere available. San Francisco receives electricity from electric-power plants, or *hydroelectric* plants, of immense capacity situated about 150 miles to the northeast on the western slope of the Sierra Nevada. Seattle is similarly supplied with electric power generated in the Cascade Mountains, and we have already referred (p. 149) to the abundance of power furnished Spokane by falls in the Spokane River. At Great Falls, Montana, the falls in the Missouri River generate electricity which is used as motive power by the Chicago, Milwaukee, and St. Paul Railway for a stretch of several hundred miles (p. 223). The Shoshone Falls in the Snake River, near the Minidoka Project which we have studied (p. 137), furnish neighboring cities and towns with such cheap power that electricity is used in almost every home for heating and cooking as well as for lighting.

The importance of hydroelectric plants



© Brown Bros.

Fig. 172. — A hydroelectric plant on the Yuba River, California

The water is brought in pipes down a very steep slope to the power house, the long low building near the center of the view. Here it is made to turn water wheels that are connected with dynamos.

Importance of small cities or towns in the arid regions. — In the interior of the arid area there are few large cities. Of the four largest, one is in Colorado, one in Utah, one in eastern Washington, and one in Montana. Name each of the four and locate it more accurately. Knowing the minerals and the agricultural products obtained near each, mention some of the leading industries.

Cities and towns containing only from 5,000 to 20,000 inhabitants are far more important than communities of equal size in the East. Fig. 233 shows only a few trunk lines extending across the country east and west, and there is not a large number of branch lines connecting them. Many ranches and even important irrigated sections are fifty miles or more from any town or railroad station. A town of less than 10,000 inhabitants, therefore, is likely to be a center for shipping cattle and sheep, for important kinds of manufacturing, and for trade, that serves people who live many miles away. It is usually a business center for many more people living outside its limits than inside. The number of automobiles parked on its principal streets may be as impressive as the number seen in many a large city. It is likely to have at least one department store, and its leading hotel is likely to be as good, if not as large, as the best in a city of 100,000 inhabitants in the Northeastern States. These facts explain why such towns as Albuquerque in New Mexico, Helena in Montana, Boise in Idaho, Phoenix in Arizona, and Laramie in Wyoming are so often mentioned in newspapers and in conversation even in the East. Locate these places.

Courtesy of Chicago, Milwaukee, and St. Paul Railway

Fig. 173. — An electric engine hauling a train in western Montana

The Chicago, Milwaukee, and St. Paul Railway was the first to operate its trains by electricity over long distances. Among the advantages of this method are the conservation of coal, the avoidance of forest fires from sparks from the engine, and greater comfort for the passengers owing to the absence of smoke and cinders.

The great resources of the Pacific Northwest. — After crossing the one-hundredth meridian in traveling westward from the Twin Cities to Seattle or Portland, one sees semi-arid land for many hundreds of miles. The absence of trees, the scattered tufts of grass, and the starved vegetation along most of the route give evidence of the lack of water. On crossing the Cascades, however, the scene abruptly changes. The dense forests, the thick, green grass, and other luxuriant vegetation suggest a heavy rainfall. Even in winter the difference in vegetation is striking, for the temperature west of the Cascades is very mild compared with that east of the same range, and flowers

The contrast between the arid area and the northwestern coast

1. In natural vegetation

often bloom throughout the year. From what you have already learned, can you explain the reason for this difference in temperature (p. 16)?

The contrast in population is as great as that in vegetation. We have already noted the thin population of the arid area (p. 130) and the small number of large cities (p. 152). West of the Cascades, however, the population is much more dense. On Puget Sound are Seattle, with a population of 315,000, and Tacoma, with 97,000; while Everett and Bellingham, each with over 25,000, are flourishing cities also. One hundred miles from the mouth of the Columbia, on the Willamette River, is Portland, Oregon, with a population of 258,000. In this relatively small area there are more than a million inhabitants. How can the development of this district be explained?

2. In population

The abundant rainfall and rich soil make farming especially attractive. The luxuriant grass is favorable to dairying, and this industry has kept pace with the development of the cities. The production of canned milk has become especially important. In addition, all the common vegetables thrive here, as well as most of the cereals. In western Oregon especially, many kinds of fruit are raised. Among these the apple is the most important, just as it is in Washington "east of the mountains" (p. 141). The pears also are of an especially fine variety; and peaches, plums, prunes, cherries, and grapes are raised in large quantities. Berries flourish also in western Washington. Large quantities of fruit from this district reach the New York and London markets.

Suitability for agriculture

This is one of the most noted lumber regions in the United States, and in the near future it is likely to be our principal source of supply. In the damp, mild climate of our western coast, the redwood, fir, cedar, and spruce grow to great size, the redwood, however, being confined to California. There are immense forests of great coniferous trees all the way from central California to Alaska. While the logs in Maine and Michigan are rarely more than two or three feet through, many in Washington and Oregon are from six to fifteen feet in diameter, and some in California are much

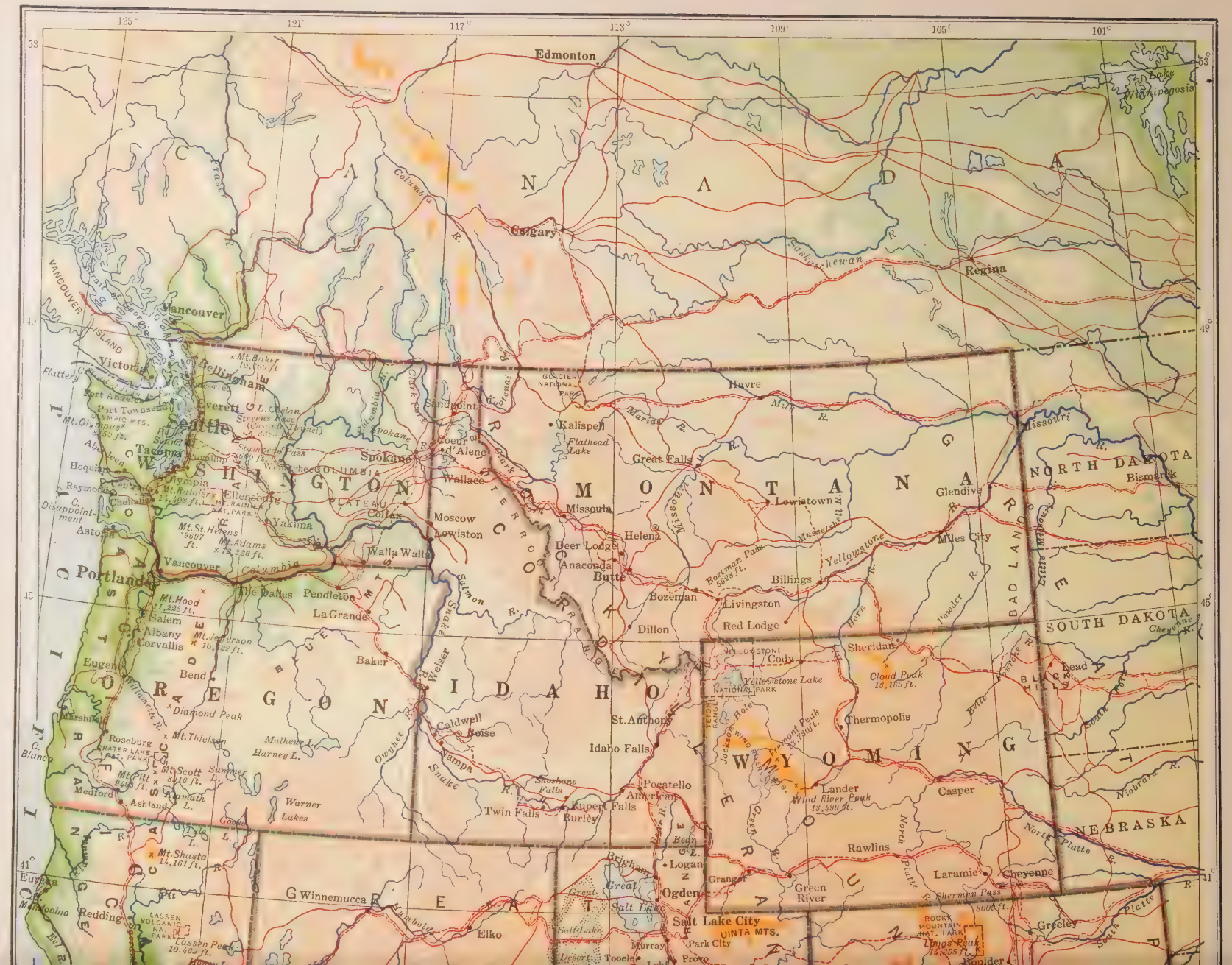
The great value of the lumber

1. The luxuriant forests

Photo by A. M. Prentiss

Fig. 174. — Felling Douglas fir in a forest in Oregon

These are about the average in size of the Douglas fir, the most important of the timber trees of the Northwest. Do you see any way in which lumber appears to be wasted here?


Edmonton
Calgary
Regina
Lake Winnipegosis
Vancouver
Victoria
Seattle
Tacoma
Everett
Bellingham
Port Townsend
Port Angeles
Olympia
Hoquiam
Aberdeen
Raymond
Chehalis
Astoria
Portland
Vancouver
Salem
Albany
Corvallis
Eugene
Marshfield
Roseburg
Medford
Ashland
Klamath L.
Bend
The Dalles
Pendleton
La Grande
Baker
Ellensburg
Yakima
Walla Walla
Lewiston
Moscow
Spokane
Coeur d'Alene
Wallace
Collax
Sandpoint
Kalispell
Flathead Lake
Glacier National Park
Havre
Great Falls
Missoula
Helena
Deer Lodge
Anaconda
Butte
Bozeman
Livingston
Billings
Lewistown
Glendive
Miles City
Dillon
Red Lodge
Cody
Sheridan
Yellowstone Lake
Yellowstone National Park
Thermopolis
Lander
Casper
Rawlins
Laramie
Cheyenne
Green River
Rock Springs
Evanston
Ogden
Salt Lake City
Park City
Provo
Tooele
Great Salt Lake
Salt Lake
Uinta Mts.
Logan
Brigham
Grantsville
Elko
Winnemucca
Humboldt R.
Redding
Eureka
Lassen Peak 10,465 ft.
Lassen Volcanic National Park
Mt. Shasta 14,161 ft.
Mt. Pitt 9,495 ft.
Mt. Scott 8,946 ft.
Mt. Thielson
Diamond Peak
Crater Lake National Park
Klamath L.
Summer L.
Warner Lakes
Malheur L.
Harney L.
Owyhee R.
Weiser
Caldwell
Boise
Nampa
Snake R.
Shoshone Falls
Twin Falls
Rupert
Burley
Pocatello
American Falls
Idaho Falls
St. Anthony
Mt. Hood 11,225 ft.
Mt. Jefferson 10,522 ft.
Columbia R.
Willamette R.
Deschutes R.
Pit R.
Klamath R.
Owyhee R.
Salmon R.
Snake R.
Bear R.
Green R.
Yellowstone R.
Missouri R.
Milk R.
Marias R.
Musselshell R.
Powder R.
Big Horn R.
Platte R.
North Platte R.
South Platte R.
Niobrara R.
Cheyenne R.
Bad Lands
Black Hills
Cloud Peak 13,165 ft.
Wind River Peak 13,499 ft.
Fremont Peak 13,730 ft.
Gannett Peak
Teton Mts.
Jackson Hole
Sherman Pass 8005 ft.
Long's Peak 14,255 ft.
Rocky Mountain National Park
Greeley
Boulder
Bozeman Pass 5525 ft.
Coast Ranges
Cascade Range
Rocky Mountains
Terrace Mts.
Bitterroot Range
Wasatch Mts.
Green Mountains
Saskatchewan R.
Columbia R.
Kootenai R.
Fraser R.
Vancouver Island
Strait of Georgia
Puget Sound
Gulf of Georgia
Disappointment C.
C. Blanco
Eureka
Mendocino
Pit R.
Klamath R.
Humboldt R.
Great Basin
Wasatch Mts.
Uinta Mts.
Park City
Murray
Tooele
Provo
Desert
Salt Lake
Great Salt Lake
Ogden
Logan
Brigham
Grantsville

WESTERN STATES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 25 50 75 100 150 200 300
Important highways
Railroads
State capitals
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
Cities with over 300,000 Los Angeles
Cities with 200,000 to 300,000 Portland
Cities with 25,000 to 200,000 Tacoma
Other cities Helena
WILLIAMS ENGRAVING CO., N.Y. 1028
Longitude West from Greenwich
121° 117° 113° 109° 105°
37° 33° 29°
NEVADA
ARIZONA
NEW MEXICO
COLORADO
UTAH
OKLA.
TEXAS
CALIFORNIA
GULF OF CALIFORNIA
MEXICO
PACIFIC OCEAN
GREAT BASIN
COLORADO PLATEAU
SIERRA NEVADA
COAST RANGES
LOWER CALIFORNIA
Sacramento
San Francisco
Oakland
Stockton
San Jose
Santa Cruz
Monterey
Fresno
Merced
Modesto
Hanford
Bakersfield
San Luis Obispo
Santa Barbara
Los Angeles
Long Beach
Santa Ana
Pasadena
San Bernardino
Redlands
Riverside
San Diego
Tia Juana
Yuma
Needles
Phoenix
Tucson
Nogales
Bisbee
Douglas
Globe
Morenci
Clifton
Jerome
Prescott
Flagstaff
Winslow
Grand Canyon
Holbrook
Gallup
Santa Fe
Albuquerque
Las Vegas
Clovis
Roswell
Alamogordo
Silver City
Las Cruces
El Paso
Juarez
Chihuahua
Durango
Silverton
Ouray
Trinidad
Raton
Dawson
La Junta
Pueblo
Colorado Springs
Cripple Creek
Salida
Moab
Richfield
Manti
Nephi
Provo
Salt Lake City
Ogden
Logan
Pocatello
Idaho Falls
Boise
Reno
Carson City
Virginia City
Tonopah
Goldfield
Ely
Las Vegas
St. George
Zion Nat. Park
Grand Canyon Nat. Monument
Natural Bridges National Monument
Mesa Verde Nat. Park
Casa Grande Nat. Mon.
Death Valley
Mt. Whitney
Mt. Shasta
Lassen Peak
Yosemite Nat. Park
Gen. Grant Nat. Park
Sequoia Nat. Park
Lake Tahoe
Walker L.
Mono L.
Tulare Lake
Salton Sea
Imperial Valley
Colorado Desert
Mohave Desert
Pt. Conception
Santa Barbara Islands
Monterey Bay
San Diego Bay
Golden Gate
Farallons
Richmond
Berkeley
Alameda
Santa Rosa
Vallejo
Angels Camp
Sevier Lake
Sevier R.
Green R.
Uncompahgre Plateau
Marshall Pass 10,846 ft.
Pikes Pk. 14,110 ft.
San Juan R.
Colorado R.
Gila R.
Salt R.
Rio Grande
Pecos R.
Canadian R.
Arkansas R.
Raton Pass 7098 ft.
Sunset Pass 3909 ft.
San Francisco Mtn. x 12,611 ft.
Roosevelt Res.
Death Valley 276 ft. below sea level
Salton Sea 268 ft. below sea level
Sunset Pass 3909 ft.

Fig. 175

Questions on Fig. 175. — 1. Trace on this map the course of the Continental Divide as shown on Fig. 17. Why does this appear to fork in Glacier National Park? 2. Except in the case of long stage routes in Nevada, important automobile routes appear to follow the railroads rather closely. Can you suggest why? 3. Identify on this map the land regions shown in Fig. 157. 4. If you wish to look up places smaller than those shown on this map, consult Fig. 499.

---

larger. A single county in Oregon is said to contain three per cent of all the standing timber in the United States.

A visit to a lumbering camp in western Washington will show that, owing to the size of the trees and to the climate, the work is carried on very differently from lumbering in other sections. The men are able to work both winter and summer. They select a tree which towers upward for perhaps 200 feet, that is, higher than most church steeples. Two men saw at this tree until the giant begins to quiver. It then tips slowly over, quickens its movement, and falls to the ground with a mighty crash, breaking good-sized trees in its way as if they were twigs.

2. Methods of lumbering

After the branches are lopped off, the tree is sawed into sections of different lengths, such as twenty-four, thirty-two, or forty-eight feet. A single log sometimes occupies an entire flat car. From 25,000 to 40,000 feet of lumber, or enough to build several small houses, may be obtained from a single large tree. The logs are dragged by a steel cable to a railroad that extends from the forest to the mills, or they are chained together in great rafts (Fig. 176) and floated to their destination. Many of the logs go to Portland and the cities on Puget Sound, where there are large sawmills. There is such an abundance of wood in this district that it is burned as fuel in the lumber mills and in locomotives on the logging railroads. A large portion of the shingles used in the East come from these forests. In fact, lumber in all forms is being shipped to the East in increasing quantities. In both Washington and Oregon lumber is now greater in value than any farm product, even wheat, and its importance is sure to increase as the supply of lumber becomes exhausted in other sections.

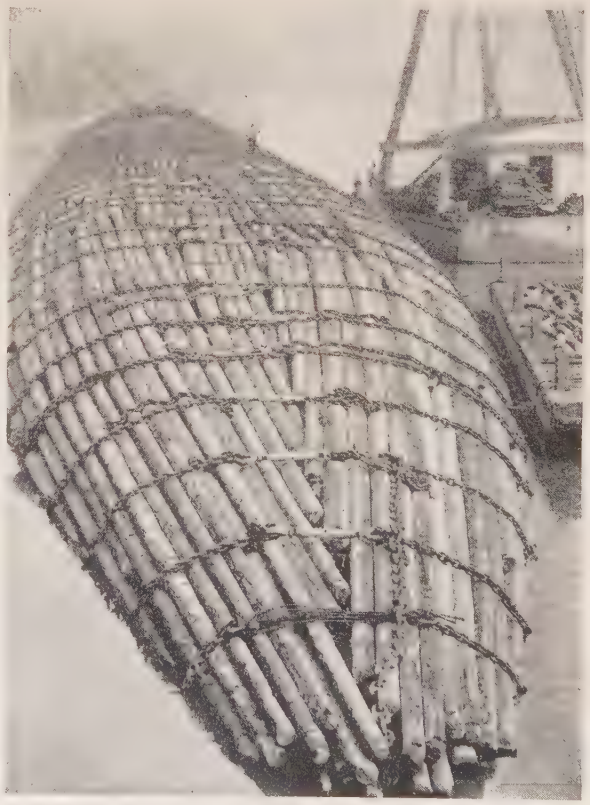


Photo by A. M. Prentiss

Fig. 176. — A raft of logs in the Columbia River, prepared for an ocean voyage.

On the Pacific coast cigar-shaped rafts are made of logs bound together by huge chains. While the rafts are being built, the logs are held in a cradle or form. After the chains are in place, the cradle is removed and the raft is ready for its journey. This raft will be towed to San Francisco.

Another industry that has attracted people to this coast is fishing. The waters

Importance of fishing

of our Pacific coast are as rich in varieties of fish as those of the Atlantic. The most important of these, commercially, is the salmon. From California northward, these are caught in large numbers as they attempt to ascend the numerous streams that flow into the ocean. The Columbia River and the Puget Sound fisheries are among the most important. The salmon spends much of its life in the ocean, but when it reaches maturity it ascends the freshwater streams to spawn, traveling in great schools toward the headwaters and ascending waterfalls many feet high. On their way they are caught by various methods. *Fish traps* are commonly used for this purpose. So also are *fish wheels* with wire buckets, that revolve in the current through which the fish swim. The buckets catch the fish up and drop them into slides below the wheels. Seines are also commonly used. The salmon are then taken to the canneries at Astoria, Bellingham, and neighboring towns, where they are cleaned and prepared for the market by smoking or, more often, by canning. Canned salmon are packed raw and cooked in the tins.

Photo by A. M. Prentiss

Fig. 177. — Drying salmon nets on the Columbia River

The nets need to be dried and mended frequently. This shows the frames on which they are stretched while drying. The man on the left is mending a net. The small boats are gasoline launches that are used to carry the men to and from the seining grounds and in lifting nets.

Another great commercial advantage in the Northwest is its superior facilities for transportation. Ocean vessels can reach Portland, where the fresh water of the Willamette River kills the barnacles on their hulls. This makes it much easier to clean the vessels by scraping them when they are put into dry dock. Canals and locks have been constructed along the upper Columbia, so that Portland has contact both by water and by rail with the country inland from it, from which are shipped large quantities of live stock and wheat. Portland also has good railroad connections with the Middle West, with California, and with Puget Sound. With these advantages, the city has become a leading center of the lumber industry of the Northwest; it exports great quantities of lumber and wheat, and is surpassed only by San Francisco among Western cities in wholesale trade.

Advantages for transportation

The cities on Puget Sound have admirable arrangements for shipping. The Sound is so inclosed that the ocean waves cannot reach it; it is largely free from drifting sand bars, which are an obstacle in many harbors; and the fresh water in the inner harbor at Seattle kills the barnacles on vessels as does the river water at Portland. Four transcontinental railroads have terminals at Seattle, so that the connection with the Middle West and East is especially good. At the same time,

the location of Seattle and Tacoma gives them excellent advantages for ocean traffic. They are natural ports for trade with Alaska, sending food, clothing, machinery, and many other goods, and receiving metals, furs, and canned salmon in return (p. 168). As Alaska grows in population this trade must increase.

The ports of the Pacific Northwest have also an advantage for trade with Japan and China, for they are nearer those countries than any other cities on our Pacific coast. Examine a globe in order to see this. Accordingly, from Seattle, Tacoma, and Portland wheat, cotton, iron goods, and lumber are shipped across the Pacific, while tea, raw silk, and rice are received in return.

Fig. 178. — Seattle and Tacoma

Name the cities on the shores of Puget Sound. On Fig. 175 trace the water route from these ports to the Pacific.

The contrast between Seattle and Los Angeles. — There is a striking difference in the conditions under which Seattle and Los Angeles have developed. The rainfall about Seattle varies from thirty to nearly a hundred inches per year, so that there is no need of irrigation there. Los Angeles, on the other hand, has less than twenty inches and little agriculture is possible without resorting to dry farming or irrigation.

Advantages of Seattle

The inland country east of Seattle is wonderfully productive, both on account of the extensive irrigation systems east of the Cascades and the unusually successful dry farming in eastern Washington. The Sierra Nevada-Cascade ranges are lower in Washington than elsewhere in their entire length, and on that account allow the west winds to carry a greater amount of vapor eastward; and evaporation is little in a region so far north. On the other hand, the region east of the San Bernardino Mountains (Fig. 175) is almost a complete desert, and for hundreds of miles in that direction there is little farming except by irrigation.

Seattle possesses one of the best natural harbors in the world, while Los Angeles has had to make an artificial harbor by constructing a very extensive breakwater. Seattle has coal near at hand, and also water power for manufacturing. Los Angeles has no coal near it, and its main supply of water has been obtained by building one of the longest aqueducts in the world, the Owens River Aqueduct, all the way from Mt. Whitney, a distance of 240 miles.

Yet, in spite of apparent handicaps, Los Angeles is much the larger city; it is, in fact, the largest city in the Western States, having a population of 577,000. While it has no coal, it has a great quantity of petroleum near at hand (p. 150). In 1920, southern California supplied twenty-four per cent of all the petroleum produced in the United States. Furthermore, while Seattle has the advantage for trade with Alaska and with Asia, the location of Los Angeles so much nearer the Panama Canal gives it a corresponding advantage for trade

Advantages of Los Angeles

© 1924 Pierson Photo Co.

Fig. 179. — The principal business district of Seattle

A portion of the Puget Sound water front is shown in the foreground. In the background may be seen Lake Union and the ship canal leading to Lake Washington.

with our Southern and Eastern States. Probably the greatest attraction of Los Angeles, however, is its almost constant sunshine, combined with its delightful temperature and dry air, which have made it a favorite residence city and tourists' resort.

Note the remarkable number of smaller cities in southern California. How do they compare in number with those about Seattle?

The advantages of San Francisco compared with those of New York City and of New Orleans. — San Francisco, the oldest of our chief Pacific ports, is the western gateway to and from the United States, corresponding to New York City in the East and New Orleans in the South. San Francisco Bay, if possible, surpasses New York Bay as a harbor, having an entrance called the Golden Gate, five miles long and one mile wide, which allows an easy entrance to vessels while it shuts out the ocean waves. Inside there is space for hundreds of ships, and there are wharves enough to accommodate all that come. Across the bay to the east are Oakland and other important cities. Name them. San Francisco is thus seen to be the center of a population approximately twice the size of the city itself. Compare it in this respect with New York.

New York Bay and San Francisco Bay compared

Inland from San Francisco is the Valley of California, drained by the Sacramento and San Joaquin rivers. While the products of this valley differ greatly from those about New York, their value is probably as great as those from any equal area near that city. East of this valley, however, is the

The districts inland from these cities compared

Fig. 180. — Los Angeles

Sierra Nevada, which forms a lofty chain and includes some of the highest peaks in the United States. On account of its height there is heavy rainfall on the windward side, yet the eastern side receives but little and the plateau for hundreds of miles farther east, including almost all of Nevada and much of Utah, is a desert or semi-desert. Examine Fig. 156 to see how much of this area is irrigated. This inland country, therefore, is strikingly different from that an equal distance inland from New York, and less productive. Thus because of the limited area of the fertile region immediately inland from San Francisco, that city is probably as limited as New Orleans (p. 123) in the productiveness of the country which seeks an outlet through it. San Francisco, however, enjoys a great advantage over New Orleans in the fact that it is the only important port between Los Angeles and Portland. Note on Fig. 175 the lack of good harbors between those cities. How far apart are they? Compare this distance with that between Galveston and Mobile, on either side of New Orleans (Fig. 112).

Fig. 181. — Los Angeles and vicinity

At how many points does the city touch the ocean? Note the network of steam and electric railways connecting Los Angeles with neighboring cities.

Again, while San Francisco faces the Orient, where there is a population nearly twice that of Europe, and has

harbor

Photo by Huddleston Photo Co.

trade with Hawaii, Japan, China, the Philippines, and Australia, those countries have developed no such commerce as have the European countries. The imports and exports of this city are similar to those of Seattle (p. 158); and great quantities of cane sugar are imported from Hawaii, so that the refining of sugar is one of its chief industries. Yet its commerce is not one tenth that of New York, which faces Europe, and is less than half that of Galveston or New Orleans, which face South America. This is likely to grow considerably, however, as we develop greater commerce with the Oriental countries.

Their ocean commerce compared

Attractions of the West for tourists. — The entire West is noted for the grandeur of its natural scenery. There is hardly a spot in this entire section from which mountains cannot be seen on a clear day. Snow-clad peaks, blue mountain lakes, and bold promontories are common in all three of the coast states, while the sunset colors in the arid region form an almost greater attraction. Even in the large cities the scenes are often of great

The scenery of the large cities

© Ewing Galloway, N. Y.

Fig. 182.—Looking down Market Street, San Francisco

At the foot of Market Street is the Ferry Building; beyond is San Francisco Bay

beauty. From the hills of Seattle one can look across Puget Sound to the Olympic Mountains on the western horizon, and from both Tacoma and Seattle Mt. Rainier, with its glaciers, is plainly visible. From Portland one has magnificent views of several snowy volcanic peaks, including Mt. Hood, Mt. Adams, and Mt. St. Helens. Locate these on Fig. 175. At San Francisco the waters of San Francisco Bay and the Golden Gate give added beauty to the mountains of the Coast Range that rise beyond them. Los Angeles, Salt Lake City, and Denver afford splendid mountain panoramas.

Fig. 183. — The San Francisco Bay region

This bay is one of the finest harbors in the world, large enough to shelter the fleets of many nations. How long is it? How wide? What cities are on its shores? Locate the two large universities. Locate the navy yard.

The great variety of attractions

At a distance from the cities, also, in many places among the Western mountains are scenes as beautiful as those of the Alps (p. 334). These attract many tourists. Strangely formed cliffs, deep canyons, lofty peaks, imposing waterfalls, and glaciers are here without number. Many of these scenes may be viewed from the train, as, for instance, the Royal Gorge through which the Denver and Rio Grande Railroad penetrates the Rocky Mountains; Pikes Peak in Colorado; Mt. Rainier near Tacoma; and Mt. Shasta in northern California. Still others, equally famous but not visible from trunk railroad lines, are Glacier National Park in Montana, Crater Lake in Oregon, and Lake Tahoe in California and Nevada. Find these on the map (Fig. 175).

Among all the interesting places, however, are three that are perhaps better known than any of the others. These are the Yellowstone National

Fig. 184. — Portland, Oregon, with Mt. Hood in the distance

Locate Portland and Mt. Hood on Fig. 175. In what direction was the camera pointed? How far away is Mt. Hood?

Park, the Grand Canyon of the Colorado River, and the Yosemite National Park.

Three of the most noted places

1. The Yellowstone Park

The Yellowstone Park, chiefly in Wyoming, is a tract of land nearly as large as Connecticut, which the government has set aside as a national park. It is often called the "Wonderland of America." A stage and automobile road leads from a spur of the Northern Pacific Railway to the Mammoth Hot Springs on the northern side of the park. There is also a highway from the Oregon Short Line on the western side, as well as a highway entering the park on the east from Cody, Wyoming. At the Hot Springs, from

a. Its hot springs and geysers

openings in the hillside, hot water flows down over beautifully colored terraces, which have been built by a deposit of mineral matter carried in solution in the hot water. Farther on are boiling springs; also boiling mud springs of different colors; and here and there are springs called *geysers*, from which hot water and steam now and then burst forth with great violence even to a height of 100 or 200 feet.

Beyond the geyser basins is Yellowstone Lake, a beautiful sheet of water nestled in the mountains, nearly 8,000 feet above the sea. It is one of the sources of the Yellowstone River, a tributary of the Missouri.

b. Its lake, falls, and canyon

Photo by A. M. Prentiss

Fig. 185. — Crater Lake, in Crater Lake National Park, Oregon

This lake occupies the crater of an old volcano. The surface of the lake is more than 6,000 feet above the sea. The water at places is 2,000 feet deep and some of the cliffs bordering the lake are 1,000 feet high.

To many persons, the falls and canyon of this river are the greatest wonders of the park. Soon after leaving the lake, the stream narrows and quickens, and the water leaps more than 100 feet directly downward. A short distance farther on it tumbles more than 300 feet, or almost twice the height of Niagara (Fig. 27). The river then runs between steep walls, which rise 2,000 feet above it. This canyon is somewhat winding, with numerous bold cliffs jutting far out into the abyss.

In this park hunting is prohibited, and for that reason wild animals are numerous and quite tame. When driving through the park one can sometimes see elk by the roadside; and bears, both brown and black, come close to camps and hotels for food. There are many other animals here, including one of the few remaining herds of bison, or buffalo.

c. Its animals

One portion of the Grand Canyon of the Colorado, in Arizona, may be reached by a branch line of the Atchison, Topeka, and Santa Fe Railway. The wonderful Yellowstone Canyon, just described, and the chasms along the Denver and Rio Grande in Colorado are pygmies compared with this.

2. The Grand Canyon of the Colorado River

As one first looks out into the canyon, nothing is seen but towers, pinnacles, many

© *Detroit Publishing Co.*

Fig. 186. — Yosemite Valley, in Yosemite National Park, California

Yosemite Valley is a gorge cut chiefly by glaciers that moved down several valleys in the Sierra Nevada and united at this point. The valley varies in depth from 3,000 to 5,000 feet.

Courtesy of Atchison, Topeka and Sante Fe Railway

Fig. 187. — The Grand Canyon of the Colorado River, Arizona

Locate the canyon on Fig. 175. At places it is more than a mile deep. This great chasm is the work of the river. For untold ages it has been wearing the rock away, making the canyon larger and larger. The material washed out of the canyon is being deposited in the delta of the Colorado River.

colored layers of rock, and apparently bottomless depths. When one finally reaches a point from which the thread-like stream may be spied at the bottom of the canyon, a mile below, it seems almost impossible that so little water could have wrought such mighty havoc. Yet this river has been slowly cutting its way into the rocks for thousands of centuries, and this great chasm is the result.

For more than 200 miles the Colorado River flows at the bottom of this deeply cut canyon, which forms almost a complete barrier to travelers. A person living on one side, where he could see across to the other side, ten to thirteen miles away, would need to travel hundreds of miles to reach that side; for there are no railways, roads, or easy paths leading across. The government has set aside this wonderland also as a national pleasure ground.

The Yosemite Valley, on the western slope of the Sierra Nevada in California, combines the grandeur of a deep canyon with the beauties of mountain scenery. The floor of this valley, reached by a branch of the Southern Pacific Railroad, is flanked by lofty, precipitous granite domes. The snow-covered High Sierra lies beyond, in the distance. Mountain creeks pour their waters over the faces of the cliffs in waterfalls of great beauty and height. Many trails lead to the summits of the surrounding domes, from which the traveler may overlook the valley many hundreds of feet below.

3. The Yosemite National Park

Only a few miles from this valley are the giant trees of the world (see Frontispiece), the *sequoias*, the largest of which is thirty-six feet in diameter and about 300 feet high. The Yosemite region, like the Yellowstone, is a public park, and is visited every year by thousands of people.

Facts to be especially well fixed. — 1. Names, location, and direction of the three principal mountain systems. 2. Climate in different regions. 3. Location of Denver; Pueblo; Butte; Helena; Boise; Salt Lake City; Santa Fé; Phoenix and Prescott; Los Angeles and cities near it; San Francisco and neighboring cities; Portland; Seattle and cities near it. 4. Location of principal coal fields; of oil districts. 5. Chief mineral products. 6. Names and location of principal rivers.

Problems for independent study. — 1. If man had the power to remove the Sierra Nevada-Cascade ranges, would it be desirable to do it? Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 26, 35 (Ginn); McMurry, C. A.: *Larger Types of American Geography*, pp. 38–39 (Macmillan). 2. Trace the Continental Divide as indicated by the sources of the rivers in the Rocky Mountains. Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 26–27. 3. Why are mountainous regions noted for mining? See Encyclopædia Britannica under *Mineral Deposits;* Tarr, R. S., and von Engeln, O. D.: *New Physical Geography*, rev., pp. 197–198 (Macmillan); Whitbeck, R. H.: *High School Geography*, pp. 237–238 (Macmillan). 4. Name several obstacles to irrigating much more of the arid area of the West. Salisbury, R. D., Barrows, H. H., and Tower, W. S.: *The Elements of Geography*, p. 449 (Henry Holt). 5. Wind is one of the greatest enemies of dry farming. Why? 6. What has been done with the Indians in the West? Carpenter, F. G.: *North America* (1915), pp. 334–335 (American Book). 7. In what part of the West would you prefer to live? Why? 8. If you were allowed to spend a winter either in southern California or Florida, which would you choose? Why? 9. Let each one of several pupils plan a month's visit in the West, and then see to what extent their plans differ. 10. Hydraulic mining has been prohibited in many sections. Why? Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 197–198 (Ginn); Encyclopedia Americana, vol. 14, p. 553. 11. Read the description of the shearing in *Ramona*, by Helen Hunt Jackson. 12. How does the West compare with the East in number of navigable rivers? Whitbeck, R. H.: *High School Geography*, p. 151 (Macmillan). 13. Let several pupils take the part of land agents, some representing the West, others the South, and let other pupils act the part of immigrants wanting homes. Then see which agents can hold out the greatest attractions. 14. Explain why California receives rain in winter but not in summer. 15. Read the booklet entitled *Glimpses of Our National Parks*. This can be secured from the Government Printing Office, Washington, D. C. 16. Read the bulletin entitled *Irrigation Projects*, published by the United States Reclamation Service, Washington, D. C. 17. Make a collection of advertisements illustrating the products of California. 18. For a

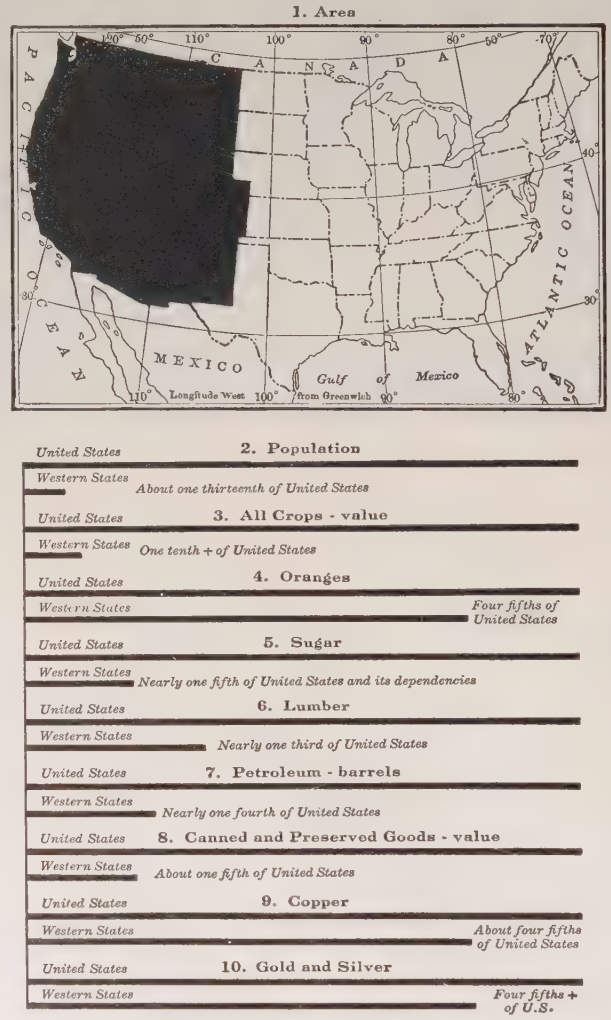

1. Area
PACIFIC OCEAN
ATLANTIC OCEAN
MEXICO
Gulf of Mexico
Longitude West from Greenwich
2. Population
United States
Western States
About one thirteenth of United States
3. All Crops - value
One tenth + of United States
4. Oranges
Four fifths of United States
5. Sugar
Nearly one fifth of United States and its dependencies
6. Lumber
Nearly one third of United States
7. Petroleum - barrels
Nearly one fourth of United States
8. Canned and Preserved Goods - value
About one fifth of United States
9. Copper
About four fifths of United States
10. Gold and Silver
Four fifths + of U.S.

Fig. 188. — The Western States in comparison with the entire United States (1920)

description of San Francisco, see Hotchkiss, C. W.: *Representative Cities of the United States* (Houghton Mifflin); The World Book, vol. 7, pp. 5190–5191. 19. Write a composition on the work of Luther Burbank. Harwood, W. S.: *New Creations in Plant Life; An Authoritative Account of the Life and Work of Luther Burbank* (Macmillan). 20. Try to obtain railroad folders describing the attractions of the West. Your local ticket agent will help you.

V. Territories and Dependencies of the United States

Political Division	Area in Square Miles	Population	Largest City	Population
Alaska	590,900	55,000 (1920)	Juneau	3,000
American Samoa	77	8,000 (1922)		
Guam	210	16,000 (1925)		
Hawaii	6,449	256,000 (1920)	Honolulu	83,000
Panama Canal Zone	554	27,000 (1925)		
Philippine Islands	115,000	10,314,000 (1918)	Manila	285,000
Porto Rico	3,435	1,347,000 (1922)	San Juan	71,000
Virgin Islands of the U. S.	132	26,000 (1917)	St. Thomas	8,000

Our increase of territory. — At the close of the Revolutionary War the United States consisted of thirteen small states, extending along the Atlantic coast from what is now Maine to Georgia. Our new nation laid claim also to land far into the wilderness, even to the distant Mississippi. Beyond this was French and Spanish territory, while the whole Mississippi Valley was occupied by Indians.

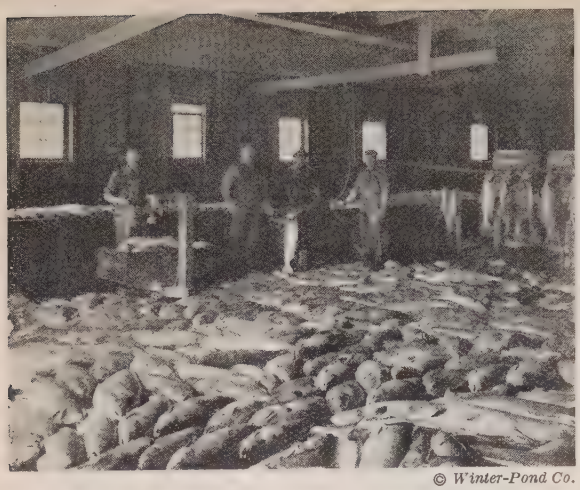
By purchase, by war, and by treaty, we have gained possession of all the other land between the Atlantic and the Pacific which has thus far been described; but our control does not end with the boundaries of the United States proper. In 1867 we obtained Alaska. In 1898 Hawaii was annexed as a territory. In the same year, as a result of a war with Spain, we secured control of Porto Rico, the Philippine Islands, and several small islands in the Pacific Ocean that serve as coaling stations for our navy and merchant vessels. (For their names see Fig. 495.) In 1903 we acquired the Panama Canal Zone (p. 206). In 1917 the Virgin Islands were purchased from Denmark.

Relations between our outlying possessions and other parts of the world. — Porto Rico and the Virgin Islands will be described in connection with the West Indies, of which they form a part (pp. 200–204). The Canal Zone will be discussed in connection with Central America (p. 205). Similarly, the Philippine Islands are closely related to the Orient and the East Indies, and should be studied in connection with those lands (p. 428). Alaska and Hawaii, however, are not so intimately connected with other important countries. They are therefore studied separately in the following sections.

1. The Territory of Alaska

The value of Alaskan trade to the United States. — Alaska has only recently been regarded as a valuable possession. When the United States paid Russia $7,200,000 for this vast territory in 1867, its value was supposed to lie solely in its fisheries and furs; for it was believed that the climate would prevent other industries and would make travel and transportation of goods impossible. But as a result

Original objections to our purchase of Alaska



© Winter-Pond Co.

Fig. 189. — Scene in a canning factory, Juneau, Alaska

of the exploration of Alaska by greater numbers of people it was found that some of these difficulties did not exist, and that others could be overcome.

The population of Alaska is only 55,000, or about a sixth of the population of Seattle; yet its area is equal to about half that of the United States east of the Mississippi River. An immense territory, therefore, looks to our western ports for its market, and a considerable trade already exists between it and the ports of our Pacific Northwest.

The nature of its exports and imports

The largest exports are fish and metals. In 1924 the fish product was worth $38,000,000; this is more than three times the value of the fish product of New England. If you examine the tins of canned salmon which you buy, you will find that many of them were packed in Alaska. Most of the sealskins used in making fur coats come from Alaska. The gold export in 1918 was worth about $16,500,000; since 1880, when mining began in Alaska, nearly $350,000,000 worth has been mined. Nearly as valuable as the output of gold is that of copper, which in 1923 exceeded $12,000,000. In some years the fish and mineral product have greatly exceeded these figures.

This territory, in turn, depends almost entirely upon the United States for its manufactured goods and for a considerable portion of its food. Portland, Tacoma, and particularly Seattle ship north large amounts of machinery, mining supplies, clothing, and food.

Only a beginning has been made in the development of this territory; many known resources have not yet been utilized and others may still be discovered. It is likely that coal and petroleum will become important exports. There are immense forests suitable for the production of paper pulp and lumber. As our own population becomes more dense, extensive use may be made of farm lands in the interior. Therefore Alaska's future value to our country is sure to be far greater than its present value.

Probable future value

Why the southeastern section has been the most developed section of Alaska. — In Fig. 206 locate the southeastern strip of

© Press Illustrating Service

Fig. 190. — Scene along the Inside Passage

For 1,000 miles north of Seattle, Alaska-bound vessels thread their way among mountainous islands, past forests and waterfalls and glaciers.

Alaska, and its chief town, Juneau. This section enjoys a much milder climate than any other part of Alaska. The prevailing winds from the Pacific give it a climate similar to that of western Washington and Oregon. The temperature seldom goes below zero, and the average for the coldest month is about the same as that for St. Louis. The moist winds striking the mountains on the coast produce an annual rainfall of 80 to 110 inches, causing dense forests on the mountain slopes and luxuriant vegetation elsewhere. The scenery is very beautiful; the higher mountain tops are covered with snow, and glaciers have carved out narrow bays resembling the fiords of Norway (p. 345). Because of the climate and scenery, this is a favorite region for tourists. From Seattle to Skagway a remarkable *Inside Passage* lies between the mainland and a wall of islands. Trace it in Fig. 206. How would you expect the island chain to affect the pleasures of the voyage?

The attractions of its climate and scenery

Fig. 191. — The Yukon River

The natives along the Yukon and its tributaries depend largely upon the salmon fisheries for their livelihood. Salmon are shown here, drying on racks. Note the log cabin at the left.

The Inside Passage is also the beginning of one of the chief routes to the interior of Alaska. From Skagway a short railroad leads over the mountains to the upper limit of navigation on the Yukon River, the remainder of the route to the interior being by boat down that river.

The mild climate of the southeastern coast favors the raising of food crops. But farming is confined entirely to the small river valleys, for the remainder of the district is very mountainous. Even in the fertile valleys, rain and fogs deprive the plants of much of the sunlight necessary for growth, so that crops sometimes fail to ripen and grains are stunted.

Its agricultural possibilities

The earliest gold discoveries in Alaska were along the coast, where mining camps were established both on the mainland and on the islands. The famous mines at Treadwell, near Juneau, have the largest stamp mills in the world for crushing ore, and immense mills of a more modern type are located just across Gastineau Channel at Thane.

The value of its exports

The waters along the coast also contain valuable resources, for the Gulf of Alaska is one of the richest fishing grounds in the world for salmon, cod, herring, and halibut. Thousands of fishermen sail each season from our Western coast for the catch. Kodiak Island, south of Cook's Inlet, and Ketchikan are important centers of the salmon industry.

The promise of another section to be more important. — The southern half of the main portion of Alaska seems likely to outstrip the southeastern extension in importance. Locate in Fig. 206 the section extending from the Copper River Valley on the east to Cook's Inlet and Mt. McKinley, the highest mountain on the continent, on the west; and north as far as Fairbanks.

The location and resources of this section

This area surpasses any other part of Alaska in wealth and variety of products. Practically all of Alaska's copper is mined in the Copper River Valley. Much of the gold comes from the Tanana Valley, in which Fairbanks is located. The two most important coal fields on the west coast of the continent are in this section, and petroleum also has been discovered here. Here also on the coast are important fisheries.

Fig. 192. — Cutting grain near Fairbanks

Successful experiments have been made with varieties of wheat that mature in the short growing season at this high latitude. Note the heavy growth of white birch.

Though agriculture is still in the experimental stage, the most promising farm lands in Alaska are in this section. The river valleys are fertile and level; and, although the winters in the interior are long and extremely cold, the shortness of the growing season, from May to September, is partly balanced by the length of the days. At Fairbanks the sun shines at this season from eighteen to twenty-one hours daily, and throughout the summer months it is light even at midnight; plants therefore mature very rapidly. Potatoes and other root crops, garden truck, blueberries, and cranberries flourish, though the great distance from world markets makes large exports of these products unlikely. Alaskan potatoes and berries have been sold in Seattle since 1918, and Asiatic Russia also promises to afford a market. How would that country be reached from Alaska? Among the grains, oats, rye, buckwheat, and spring wheat can be raised. There is much excellent pasturage, for grass grows rapidly. If hardy varieties of sheep and cattle, such as those of northern Europe, are extensively introduced, the raising of live stock may become important.

The short railroad up the Copper River has until recently been the only important one of this section; consequently it has been impossible to develop the many resources at a distance from it without great expense. For instance, it has been cheaper to import lumber from Puget Sound than to draw on the forests near by; and many of the farm lands have been so far inland as to be of little use. But our government has recently built a railroad

Provisions for transportation

from Seward, on the coast, and Anchorage, on Cook's Inlet, to Fairbanks. Locate it in Fig. 206. This railroad has already been of the greatest importance in developing the coal fields and other rich natural resources of the interior of the territory. It at once became the chief route to the Yukon Valley, diverting to itself much of the traffic that was formerly shipped by the Yukon River, as previously indicated (p. 169). If you were shipping goods from Seattle to Fairbanks would you choose the route by way of the Yukon or by way of the new railroad? Why?

Fig. 193. — Fairbanks, Alaska
This view was taken from the belfry of the northernmost high school in the western hemisphere.

Prospect for northern and western Alaska. — The great plains of northern and western Alaska are swept by cold winds from the Arctic Ocean and Bering Sea and have a severe climate. In the northern part the Arctic summer lasts but six weeks; only Eskimos and Indians live there. The most valuable region is the west coast on Seward Peninsula, where some of the richest gold discoveries in the territory have been made. This section is bleak and desolate except for two or three months in summer, when the sun shines most of the twenty-four hours each day. Ocean traffic is possible only in summer; in winter the route for travel southward is by sled to Nenana (Fig. 206), and thence by the Alaska Railroad to the open ports on the Gulf of Alaska. Mention some of the difficulties that would be encountered on such a trip. Yet with the first discovery of gold on the Seward Peninsula, Nome was settled and sprang into a thriving town in a single year. Compare its latitude with that of Fairbanks. Estimate the distance of both from the Arctic circle. How would conditions of living in either place differ from those to which you are accustomed?

Fig. 194. — Traveling with dog teams
Dog teams can be driven where horses cannot go because of the cold and the deep snow.

Measures of the government for protection and development of Alaska. — Until 1912 Alaska was governed entirely from Washington; but in that year it was organized into a territory with its own legislature, which with certain restrictions, now makes the laws. It also elects a delegate to our Congress. Thus our former disadvantage of governing Alaska from a great distance and not always knowing its real needs has been in some measure overcome.

Some of the most important laws passed by our government have been for the pro-

tection of its natural resources. Since our purchase of Alaska, the killing of fish and game has been enormous and wasteful. Whaling was formerly an important industry about Point Barrow, the most northern point; but now the few remaining whales must be sought far out in the Arctic Ocean. So many seals were killed that the important seal industry of the Pribilof Islands in Bering Sea was nearly destroyed. Locate these islands. The killing of a limited number of fur seals each year, and the sale of the furs, are now a task of the government Bureau of Fisheries. The salmon industry is being promoted by government fish hatcheries.

Fig. 195. — Fur seals on one of the Pribilof Islands

Every year the Bureau of Fisheries takes a census of the seals. In 1921 there were 581,000 seals under government protection. Estimate the number of seals in the picture. What proportion is it of the total seal population?

Caribou still furnish the natives of the far North with much meat; but when the white men came, this source of food had to be shared with them. The government, however, has been successful in introducing reindeer from Asiatic Russia to take their place. The reindeer furnish milk and meat, and there is even a possibility that reindeer meat may become an important export to our Pacific ports. The natives make the skin and bones into clothes, tents, utensils, and sleds.

The government has taken control of the coal lands and oil fields in order to guard them against waste or misuse. It also protects the valuable forests on the southern and southeastern coasts.

Farming has also been developed by five government agricultural experiment stations, which are located in widely separated parts of Alaska. At these stations it was first shown that many of the products already mentioned could be raised.

Facts to be especially well fixed. — 1. The natural divisions of Alaska and the climatic conditions of each; opportunities for agriculture in each. 2. Location of Juneau; Mt. McKinley; Fairbanks; Anchorage; Pribilof Islands; Seward; Seward Peninsula; Nome. 3. Course of Yukon River. 4. Course of the government railroad. 5. Products of Alaska.

Problems for independent study. — 1. The population of Juneau increases considerably in the winter. How do you explain this fact? 2. How does a mining camp in the Fairbanks or Nome district differ from one in the western portion of the United States? Sunset Magazine, July, 1916, pp. 33–35, 94–97; Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 191–198 (Ginn); Higginson, E.: *Alaska*, pp. 514–528 (Macmillan). 3. Write a composition on the importance of transportation routes in the development of Alaska. National Geographic Magazine, 1914, vol. 25, pp. 185–186; New International Year Book, 1919, p. 33. 4. What attractions has Alaska for immigrants? Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 194, 313–315; World Book, under "Alaska"; National Geographic Magazine, 1914, vol. 25, pp. 183–225. 5. Write a paper on Seward's farsightedness in the purchase of Alaska. Carpenter, F. G.: *North America* (1915), pp. 336, 338,

346–352 (American Book); Winslow, I. O.: *Our American Neighbors*, pp. 34–44 (Heath); Dryer, C. R.: *Elements of Economic Geography*, pp. 370–373. 6. Read Gilman, Isabel A.: *Alaska: The American Northland* (World Book). 7. Compare Alaska in area, population, and resources with the Scandinavian Peninsula (pp. 344–349).

2. The Territory of Hawaii

Value of the Hawaiian Islands to the United States. — In 1898, when the United States acquired the Philippine Islands at the close of the Spanish War, it became important for us to have a coaling and repair station for our ships in the middle of the Pacific. This is one of several reasons why the United States in that year annexed the Hawaiian Islands, which had more than once requested union with us. Estimate in Fig. 495 the distance from San Francisco to Manila. What is the distance from San Francisco to Honolulu? Only the most modern ships can make the long trip entirely across the Pacific without renewing their supply of fuel on the way. Many of the larger vessels can carry no more than 800 tons of coal; but as sixty or seventy tons may be burned each day, this supply would last less than two weeks, while the voyage requires more than three weeks. Therefore, the government needs a place along the route where it can store large quantities of coal or oil.

Their value for commerce and defense

On such a long voyage, also, ships are liable to have accidents that call for extensive repairs. These islands have been of value to us in both these respects. A dry dock capable of handling the largest merchant ships on the Pacific as well as our largest battleships has been constructed by our government at Pearl Harbor, near Honolulu. To-day ships can be taken out of the water and repaired at this distant island as well as at one of our great shipbuilding ports.

Courtesy of Pacific Ports

Fig. 196. — A portion of Honolulu harbor

Honolulu is visited by many steamers in their transpacific voyages. Pearl Harbor, a United States naval base, is only a few miles distant. Name one of the mountains by reference to Fig. 453.

However, these islands are of far greater importance to us as a naval base for use in war than as a coaling and repair station. In case of war our ships can now protect our Pacific coast from this base, and at the same time prevent an enemy from using the islands as a base of operations. With this end in view the United States has fortified Pearl Harbor.

The annexation of Hawaii was desirable not only for purposes of defense but also

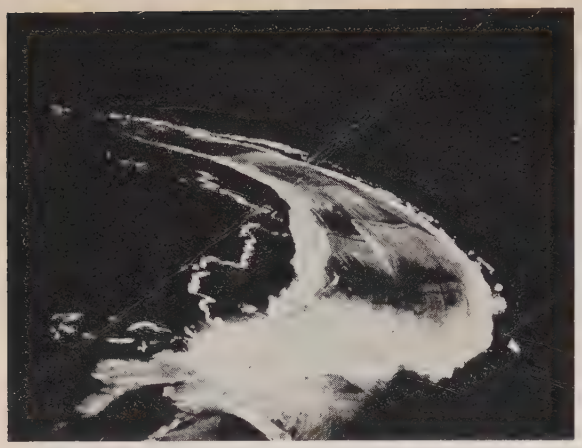


Fig. 197. — A night view of the glowing lava in Kilauea

because of their value for agriculture. The soil requires fertilizing, being composed mostly of lava and volcanic ash. The islands are the tops of a range of mountains thrown up as lava from the bottom of the sea. These mountains have their bases 12,000 to 18,000 feet below the surface of the water and some of them tower more than 13,000 feet above the surface. Some of the greatest active volcanoes of the world are on the island of Hawaii, the largest in this archipelago. Mauna Loa, the highest (13,675 feet), is inactive except at intervals; in 1919, however, lava broke forth and flowed to the sea, thirty miles away. Kilauea (4,000 feet), on the island of Hawaii, is active all the time. The crater (Fig. 197), which can be reached by automobile, is one of the most spectacular sights in the world.

Their value for agriculture

1. How the soil and climate favor agriculture

These islands lie just within the tropics and are surrounded by the warm waters of the Pacific; they are therefore well adapted to tropical products. There is little variation of temperature from day to day, or even from season to season; so that two, and sometimes three, crops are produced each year. The warm trade winds bring abundant rainfall to the windward slopes of the mountains, and the vegetation is luxuriant and brilliant in coloring. From what direction do these winds blow? But the leeward slopes and the lowlands near the coast get little moisture. Why? (See p. 236.) About two thirds of the cultivated land must be irrigated. Although some of the water for irrigation must be pumped with imported coal — for the islands have none — farming is still a profitable venture, because crops grow so well in the rich soil and warm climate.

Sugar is the most important product. Since long before the islands became a territory of the United States, their sugar was shipped to us free of duty, which gave Hawaiian sugar an advantage over that from other countries. In consequence, this industry has greatly prospered. The sugar plantations are among the best equipped in the world, having irrigation canals, sugar mills, and railroads for the transportation of the cane. Unlike that of Louisiana, the sugar cane in Hawaii is allowed to grow until it matures, because there is no frost. This requires about eighteen months. A fire is then run through

2. Their principal products

© E. M. Newman

Fig. 198. — A field of pineapples in Hawaii

Note how fully the slopes are kept under cultivation.

it to burn the dead leaves and weeds. Several crops are grown from the same roots before replanting is necessary. On the best-watered lands the yield has been as high as 100 tons to the acre, by far the highest in the world. How does that compare with the yield in Louisiana (p. 107)? By far the most important Hawaiian export is sugar, practically all of which is sent to the United States (p. 161).

Pineapples are second in importance, 6,000,000 cases being produced in 1924. Coffee and bananas are produced in small quantities, and attempts are being made to increase the output of rubber.

The mixture of races. — Most of the plantations on the islands are owned by Americans. They have had to import labor from other countries because the natives are few. Only one tenth of the population is native; two fifths are Japanese; the remainder are Chinese, Portuguese, Filipinos, Spaniards, Koreans, and Americans.

Facts to be especially well fixed. — 1. Latitude of this archipelago, and its distance from San Francisco. 2. Its climate. 3. Its chief products. 4. The height and location of the two chief Hawaiian volcanoes.

Problems for independent study. — 1. Make a drawing to show the appearance of the Hawaiian mountains both above and below the surface of the sea. 2. Compare these islands with Florida and California as a winter resort. Chamberlain, J. F. and A. H.: *Oceania*, see "Hawaii" (Macmillan); Winslow, I. O.: *Our American Neighbors*, pp. 95–98 (Heath); Johnson, C.: *What to See in America*, pp. 182–203, 456–494 (Macmillan). 3. Where would you expect coal to be obtained for these islands? 4. Explain why these islands desired to become a part of the United States. (See p. 174.) 5. Read Baldwin, C. W.: *Geography of the Hawaiian Islands* (American Book). 6. Read the section on "Volcanoes" in Whitbeck, R. H.; *High School Geography*, pp. 219–225 (Macmillan). 7. What other American dependency is due north of the Hawaiian Islands?

VI. Canada and Newfoundland

1. Canada

	Area in Square Miles	Population	Largest City	Population
Alberta	255,300	588,000	Calgary	63,000
British Columbia	355,900	525,000	Vancouver	117,000
Manitoba	251,800	610,000	Winnipeg	179,000
New Brunswick	28,000	388,000	St. John	47,000
Nova Scotia	21,400	524,000	Halifax	58,000
Ontario	407,300	2,934,000	Toronto	522,000
Prince Edward Island	2,200	89,000	Charlottetown	12,000
Quebec	706,800	2,361,000	Montreal (1925; other figures are for 1921)	908,000
Saskatchewan	251,700	758,000	Regina	34,000
Yukon Territory	207,100	4,000	Dawson	1,000
Northwest Territories	1,242,200	8,000		
Total for Canada	3,729,700	8,789,000		

Questions. — 1. Which of the above areas do you suppose to be rough estimates? Why? 2. Compare the density of population of the Northwest Territories with that of Alaska; of Prince Edward Island. 3. Why do you suppose that no "largest city" is listed for the Northwest Territories?

The great area of Canada and some of the limits to its usefulness. — Canada has an area larger than that of the United States including Alaska and our other dependencies, and nearly equal to that of all the countries

© Detroit Publishing Co.

Fig. 199. — Mount Massive, Alberta

The Canadian Rockies are famous for their mountain scenery. Though the summits are in general lower than in the western part of the United States, the mountains are often more rugged and the snow line is lower.

of Europe put together. Yet it can never be as important as its area suggests. Fig. 12 shows the part made nearly useless by the cold. There are few trees, as we have seen (p. 13), north of the line where the average temperature in July is only 50°. That region can be used only for fishing and hunting and for reindeer grazing. About what portion of the entire area of Canada does it include?

The Ice Sheet that once covered a large part of North America did its greatest damage in the region now included in southern Canada. It not only caused thousands of lakes here by leaving the surface very irregular, but it scraped southward much of the soil from one large portion of the country. In Fig. 8 you can see the area that suffered in this way. Trace the southern boundary of the area of thin soil. In many places the rock lies bare, and only here and there where the soil has been caught in pockets can agriculture flourish. Vast forests now occupy this region, which on account of its thin soil is unlikely to be denuded of its timber to permit agriculture.

This area of thin soil includes fully half of Canada. When this is added to the portion unsuited for agriculture because of cold, less than a fourth of the total remains. Much even of this remainder can never be very productive, owing to the mountains and plateaus. Locate some of these, both in the east and in the west. Only about one fifth of the total

area of Canada can be considered as arable land. This is an enormous amount, however, and a far greater area than is possessed by many other countries.

The settled part of Canada and how it is divided. — Fig. 10 shows the part of Canada that has been settled. Note how long and narrow it is, extending from ocean to ocean. Estimate its length.

This region is naturally divided into four parts. The state of Maine extends so far north as almost to cut off from Quebec the three Atlantic provinces of New Brunswick, Nova Scotia, and Prince Edward Island. These form a group by themselves called the Maritime Provinces. The valley of the St. Lawrence and the thickly settled part of Ontario are separated from Manitoba by a vast forest growing on the thin soil north of Lakes Huron and Superior (Fig. 14). Quebec and Ontario may therefore well be studied together. The Rocky Mountains form a lofty wall between Alberta and British Columbia, dividing western Canada into the Prairie Provinces of Manitoba, Saskatchewan, and Alberta, and the mountainous province of British Columbia.

land in surface, climate, and farm products. While much of the surface is rugged, there are many fertile valleys that produce grains, apples, such vegetables as potatoes and turnips, and live stock. Pine forests like those of Maine extend over this region also, and a great amount of lumber is produced. Fish are abundant in the surrounding waters; their nearness to the Newfoundland fishing banks gives the fishermen of this region an important advantage

© Brown Bros.

Fig. 200. — Fish prepared for smoking, Prince Edward Island
What are the three common ways of preserving fish?

The Maritime Provinces. — The Maritime Provinces contain some of the oldest settlements in North America. The northwestern part of Nova Scotia is often called the Land of Evangeline because it is the Acadia that Longfellow so beautifully pictures in his story of Evangeline. The whole region resembles New England in its advantages over those of New England who go there for cod.

Advantages they enjoy

In another respect these provinces have a great advantage over New England. While the latter lacks both coal and iron ore, Nova Scotia has an abundance of both, as well as of limestone — the three materials necessary for iron manufacture. Nova Scotia has blast furnaces at Sydney and other points near by, and supplies much coal to the eastern part of Canada. Indeed, coal

can be shipped very cheaply from that province to Boston, so that it can compete with Pennsylvania in supplying the factories of New England with fuel. In return, New England's manufactures are especially welcome in these provinces because the Canadians of this section are still mainly interested in agriculture.

Halifax, however, the leading city, is an important shipbuilding center. This city has a magnificent harbor and is several hundred miles nearer England than any of our own large ports. In Fig. 495 estimate how much nearer it is to Liverpool than is New York.

In spite of such advantages, these provinces have not greatly increased in population during recent years. Halifax at the time of the last census had a population of less than 50,000, and Prince Edward Island had even lost in population during the preceding ten years. Their nearness to Europe is not in every respect a help. During the winter months, to be sure, it gives them an advantage; for when the St. Lawrence River is frozen over, freight and passengers bound abroad go to St. John and Halifax by rail to take ship. They also enter Canada from abroad by the same route. But in the summer months they do not have to pass through these provinces in going to and from the interior, as they must pass through New York in going to or from Chicago or the West. For that reason, business men, visitors, immigrants, and freight have passed them by.

Why they have not increased more rapidly in population

© Underwood and Underwood

Fig. 201. — A lake vessel on the Welland Canal

Find the Welland Canal on Fig. 32. Between what lakes does it extend? How much lower is Lake Ontario than Lake Erie?

Why Ontario and Quebec are most thickly settled. — The leading reason for the denser population in parts of Quebec and Ontario is the large area of deep, fertile soil. A narrow strip of land on each side of the St. Lawrence and the southernmost portion of Ontario is especially fertile. Grains and vegetables are grown here extensively, and cattle and dairy products are abundant. The area nearly surrounded by lakes Ontario, Erie, and Huron resembles western New York and northern Ohio in its advantages for fruit growing, and is noted particularly for its grapes, apples, and peaches.

Their advantages for agriculture

The excellent waterways have also exerted great influence. The Great Lakes and St. Lawrence River form the finest interior water route in the world (p. 90). At first, rapids in the river and the difficulty of getting from one

Their conveniences for transportation by water

lake to another limited its use; but canals now overcome these obstacles. The Soo Canal leads from Lake Superior to Lake Huron; the Welland Canal from Lake Erie to Lake Ontario; and other canals lead around the rapids in the St. Lawrence River.

This route has one advantage over that from Duluth to New York City. While the new Barge Canal connecting Buffalo with the Hudson River permits the use of boats drawing ten feet of water, this Canadian waterway is large enough for boats drawing twelve feet. Small ocean vessels can, therefore, reach Port Arthur or Fort William. The larger ocean vessels can go up the river no farther than Montreal, so that this city is the place where most of the commodities bound east or west are transferred from one kind of vessel to another, or *transshipped*. Thus Montreal, like New York, is an important gateway to Europe, which helps to explain why it is the largest city in Canada. Compare it in population with the city of Quebec. What other important Canadian cities are located upon this waterway?

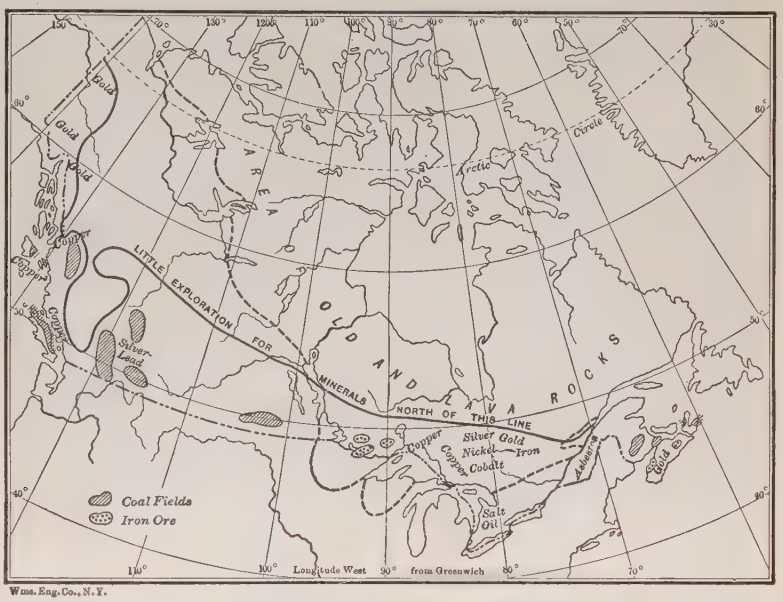


Fig. 202. — Distribution of minerals in Canada

Note how small an area has been explored for minerals. The metals occur chiefly in the area of old and lava rocks.

Fig. 202 shows how rich Ontario is in minerals. The nickel deposits are the largest in the world, and large quantities are shipped to the United States and other countries. Silver is mined extensively in northern Ontario, and in Quebec there are several important asbestos mines. What are the chief uses of asbestos?

Their advantages for mining and manufacturing

The most necessary mineral, however, is lacking in these two provinces. Can you name it? Nevertheless, manufacturing is rapidly developing. With vast forests near at hand, many sawmills are to be expected. Ottawa produces a great amount of lumber, and, together with Montreal and Toronto, manufactures large quantities of furniture. Shipbuilding is an important industry not only at Halifax but also at Montreal and at Toronto and several other cities on the Great Lakes. Pulp wood for paper is another important product. While coal has to be imported, a large amount of electric power is obtained both from Niagara Falls and from the rivers that descend from the Laurentian Highland to the St. Lawrence. Textiles, particularly cotton and woolen goods, and food products — such, for example, as meats, fish, and fruits — are extensively prepared for market. These two provinces manufacture far more goods than all the others together.

As might be expected, Ontario and Quebec

must import many manufactured goods. They also require coal with which to smelt their ores and heat their houses, cotton for their textile mills, citrus fruits, and corn for their live stock. On the other hand, they can export lumber, pulp wood, some kinds of fruits, butter and cheese, and other farm products in large quantities. We, in turn, can export to them large quantities of manufactured articles, as well as coal, cotton, corn, and semi-tropical products in return for their surplus products. Thus a great amount of trade takes place to the advantage of both nations. The distances, too, are not great between large cities north and south of the boundary. Estimate the number of miles from New York to Montreal (Fig. 32). How does it compare with the number from New York to Pittsburgh? What is the distance from Buffalo to Toronto? From Hamilton to Detroit?

Favorable conditions for trade with the United States

© Keystone View Co., Inc.

Fig. 203. — Montreal from Mount Royal

Note the St. Lawrence River in the background and the great bridge crossing it. The river is open except for about four months in winter. What river enters the St. Lawrence here (Fig. 206)?

Canada has much more trade with the United States than with any other country, not excepting England. These are some of the reasons why Ontario and Quebec are the most populous provinces. Compare their populations with those of the other provinces (p. 175).

The most rapidly growing part of Canada. — The most rapidly growing parts of Canada are the two western sections (p. 177), corresponding to our states from the Dakotas to Washington. During the past few years immigrants have been pouring into these provinces. In 1913, 139,000 people emigrated from the United States to Canada, most of whom settled in the Prairie Provinces. The population of Saskatchewan in 1901 was only 91,000, while in 1921 it was 758,000; and Alberta has grown almost as fast.

Their attractions for immigrants

It has been the possibility of raising wheat that has attracted most of the settlers to this region. As one travels across Manitoba, Saskatchewan, and Alberta in July one sees wheat on all sides, even more of it possibly than is found in our own states just south of the border. Hundreds of grain elevators give evidence that this is one of the greatest wheat regions of the world.

Their agricultural possibilities

At first wheat was almost the only crop, but now mixed farming is becoming common. Oats, barley, flax, and rye, grains that are more hardy than wheat, are grown, particularly in the northern districts, and cattle are rapidly increasing in number.

© Detroit Publishing Co.

Fig. 204. — Pulp mills and iron works at Sault Ste. Marie, Ontario

The Canadian "Soo" is well located for the manufacture of paper. Vast forests are near by, there is an abundance of water power, and the lake water is always free from sediment. There are also good opportunities for shipping the product.

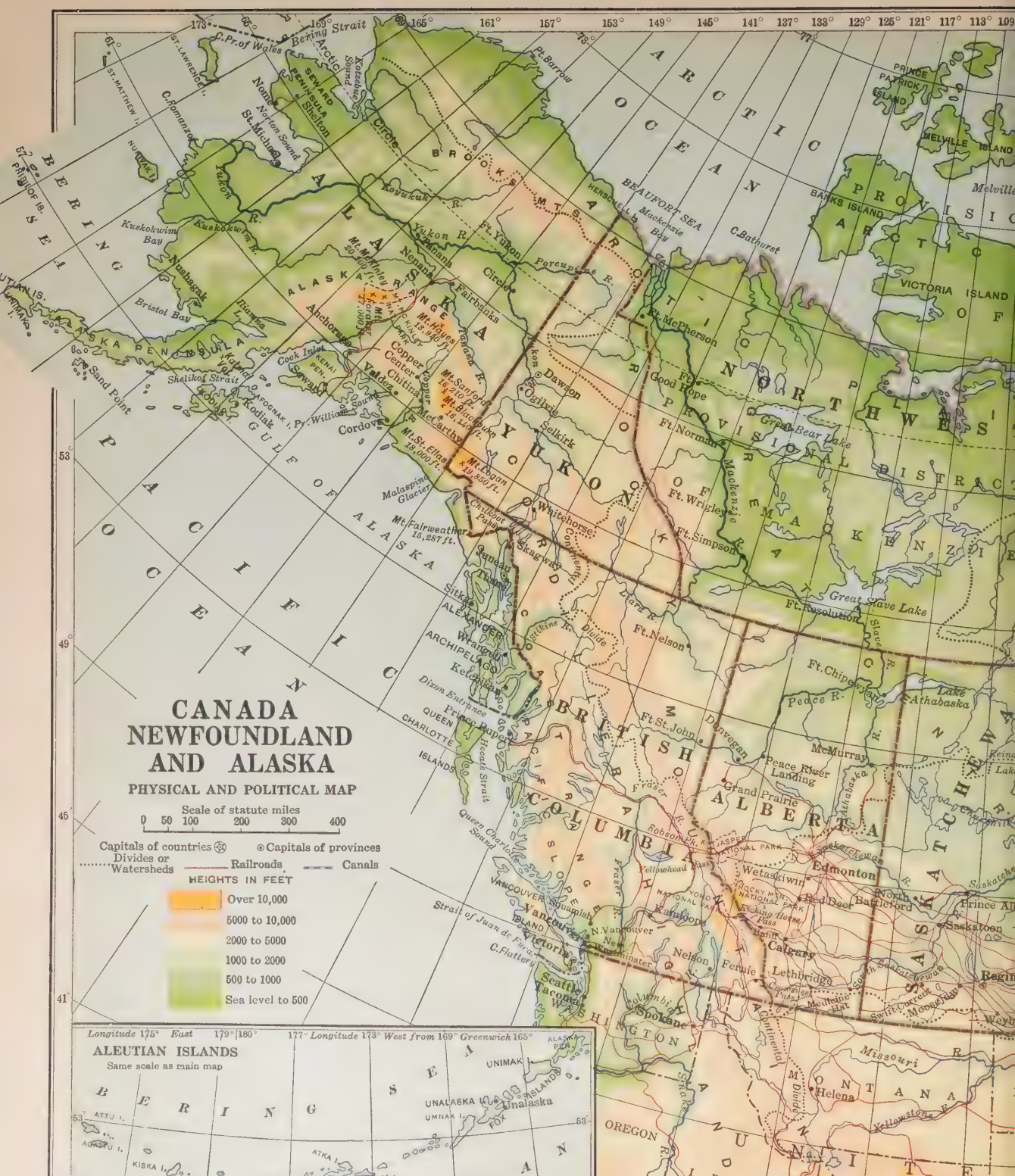
The main difficulty, aside from the possibility of frost, is lack of moisture. Where the damp westerlies from the Pacific Ocean strike the Coast Range in British Columbia, the annual rainfall is ninety inches or more, which favors the growth of a mighty forest, as well as of hay and vegetables. The most valuable and most common tree is the Douglas fir, which sometimes attains a height of nearly 300 feet and a diameter of fifteen feet. The westerlies leave large areas with little rainfall, however, between the Coast Range and the Rockies; and beyond the latter in western Alberta there are only from ten to fifteen inches of rain. In both regions dry farming and grazing are common, as in some of our Western States, and irrigation systems are being developed both in the Fraser Valley of British Columbia and in southern Alberta.

Its varying amount of rainfall, and the results

From The Geography of the World's Agriculture

Fig. 205

In what three provinces does most of the wheat of Canada grow? What states in our country lie to the south of these three provinces?


CANADA
NEWFOUNDLAND
AND ALASKA
PHYSICAL AND POLITICAL MAP
Scale of statute miles
0 50 100 200 300 400
Capitals of countries
Capitals of provinces
Divides or Watersheds
Railroads
Canals
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
ALEUTIAN ISLANDS
Same scale as main map
Longitude 175° East 179° 180° 177° Longitude 173° West from 169° Greenwich 165°
BERING SEA
PACIFIC OCEAN
ARCTIC OCEAN
ALASKA
YUKON
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
NORTHWEST PROVISIONAL DISTRICT
MACKENZIE
Bering Strait
Arctic Circle
Yukon R.
Mackenzie R.
Mt. McKinley 20,300 Ft.
Mt. Logan 19,500 Ft.
Mt. St. Elias 18,000 Ft.
Mt. Fairweather 15,287 Ft.
Edmonton
Calgary
Vancouver
Victoria
Seattle
Spokane
Fig. 206

ELLESMERE ISLAND
DEVON ISLAND
BAFFIN BAY
DISTRICT OF KEEWATIN
TERRITORIES
SOUTHAMPTON ISLAND
UNGAVA PENINSULA
Payne L.
Ungava Bay
Hudson Strait
Fox Strait
C. Mercy
C. Chidley
DAVIS STRAIT
Upernivik
Godhavn
DISKO
GREENLAND
(To Denmark)
Arctic Circle
Denmark Strait
Godthaab
Julianehaab
C. Farewell
ATLANTIC OCEAN
LABRADOR
Hopedale
(To Hamilton Inlet)
Newfdl.
Lake Melville
Hamilton R.
LABRADOR PENINSULA
Battle Harbor
C. Bald
Belleisle Strait
Millingate
NEWFOUNDLAND
St. John's
C. Race
HUDSON BAY
Churchill
Churchill R.
York Factory
Port Nelson
Nelson R.
Ft. Severn
East main R.
Rupert R.
James Bay
Severn R.
MANITOBA
Winnipeg
Albany R.
Ft. Albany
Moose Factory
Albany
Cochrane
ONTARIO
Kenora
Lake Nipigon
Port Arthur
Ft. William
LAKE SUPERIOR
Sault Ste. Marie
Sudbury
Cobalt
Lake Nipissing
North Bay
Ottawa
Kingston
Lake Champlain
Duluth
MINNESOTA
LAKE HURON
Toronto
Hamilton
Buffalo
London
LAKE ERIE
Detroit
Cleveland
Minneapolis
St. Paul
WISCONSIN
MICHIGAN
Milwaukee
Chicago
IOWA
PENNSYLVANIA
Philadelphia
New York
Boston
Portland
Yarmouth
C. Sable
Halifax
Sable I.
NOVA SCOTIA
NEW BRUNSWICK
Chatham
Moncton
Fredericton
St. John
Edmundston
Quebec
Three Rivers
Montreal
Hull
Valleyfield
Joliette
Lake St. John
Roberval
Tadoussac
Levis
St. Lawrence R.
GULF OF ST. LAWRENCE
ANTICOSTI I.
PRINCE EDWARD ISLAND
Charlottetown
Summerside
CAPE BRETON ISLAND
Sydney
Glace Bay
Port aux Basques
Bonavista
Argentia
St. Pierre (Fr.)
Miquelon (Fr.)
C. Race
Greenwich
1926
WILLIAMS ENGRAVING CO., N.Y.

Fig. 206

Questions on Fig. 206. — 1. Trace the Continental Divide between the Atlantic and the Pacific oceans; between the Arctic and the Atlantic; between the Arctic and the Pacific. 2. Trace the Inside Passage from Seattle to Skagway. 3. Compare the number of cities and railways in southern Alberta with that in the same latitude in Quebec. How do you account for the difference? 4. How does the Laurentian Highland compare in altitude with the Appalachian Highland? 5. If you wish to look up smaller places in Ontario and Quebec than are shown here, consult Figs. 32 and 501.

What does Fig. 13 show with reference to the rainfall in the western section of Canada?

Why conditions in these provinces are surprisingly favorable to agriculture

For many years it was commonly supposed that western Canada was too cold for farming and grazing; but this supposition has been found to be incorrect. The influence of the westerlies in producing a mild climate in British Columbia is easily understood; but how very mild they make it is seldom appreciated. In what temperature region is this section of Canada (Fig. 12)? The Pacific coast of North America is many degrees warmer than the Atlantic coast in the same latitude. In consequence, there is seldom any frost even in January at Victoria and the flowers in the gardens there often bloom through most of the winter, although that city lies farther north than Quebec.

1. Influence of the west winds

The greater the distance from the ocean, the more extreme are the summers and winters, and in most districts east of the Rockies, as in parts of the Great Plains in our own country, nothing enables the farmer to survive during the winter except warmly built houses and barns, and plenty of fuel. In what temperature region is most of Alberta (Fig. 12)? At Edmonton in Alberta the temperature frequently falls to 45° below zero.

Two features of the plateau region, however, are greatly in the farmer's favor. One is the Chinook winds (p. 147) that descend the eastern slopes of the Rockies and spread far out over the plains. In winter they melt the snow so rapidly that they are known as snow-eaters; and they are so frequent that they allow snow to remain on the ground only for short periods. That is fortunate for the farmer, because the drier districts are given over to grazing and without such exposure of the pasturage the cattle and sheep would perish. Owing to these winds the winters on Peace River in northern Alberta are far milder than might be expected and the springs are earlier. All the grains and vegetables that are raised about Toronto will ripen at Dunvegan in Alberta, which is more than 700 miles farther north (Fig. 206). The influence of these winds diminishes, however, toward the east, and Saskatchewan and Manitoba are well beyond their reach.

2. Influence of the Chinook winds

The other fact that greatly favors the farmer is the long period of sunlight each day during the summer. Sunlight, as you know, is necessary to the growth of plants. Accordingly, when they receive it nearly eighteen hours out of the twenty-four, as they do in midsummer in these provinces, they mature with astonishing speed. We have already seen how long hours of sunlight affect vegetation in Alaska (p. 170). Experiments have shown that many plants will grow twice as rapidly during an eighteen-hour day as during a twelve-hour day. Thus the long day helps to make up for the short summer season and the great slant of the sun's rays.

3. Effect of long hours of sunlight

The four western provinces are chiefly engaged in the production of food and raw materials for manufacturing. The prin-

cipal products from the Prairie Provinces are wheat and meat. British Columbia grows apples extensively, and other fruits such as are common in Washington (p. 141). Its supply of timber is vast; and the same can be said of its fish. Since 1912 it has surpassed Nova Scotia in its fisheries. The salmon often so choke the small streams that they may be tossed out upon the banks with pitchforks. The output of coal, also, is important, surpassing that of all the other provinces except Nova Scotia. The production of these various commodities far exceeds their home consumption and affords large quantities for export; but manufacturing is little developed.

Opportunities for trade between these provinces and the United States

On the other hand, our Pacific coast states need cheap coal badly. Lumber is becoming more and more expensive in the United States because our forests have been so depleted. Food of all sorts must be imported more and more, as we manufacture more extensively, and our manufactured articles, such for example as clothing and farm machinery, are just the things that these provinces must import. Thus the conditions are very favorable for commerce between them and us, and for close friendship. In Fig. 206 note the number of railways that connect the two countries.

How the different parts of Canada are held together. — The populated portion of Canada is a narrow strip of territory some three thousand miles long, which falls naturally into several divisions, as stated on p. 177. Even Quebec and Ontario are unlike in very important respects. The former, for example, is chiefly Catholic in religion and French is widely spoken, while Ontario is Protestant and English-speaking. How are districts so unlike one another held together?

One means is the excellent government, and the close relation of the entire Dominion to Great Britain, the mother country. The provinces are united much as our states are, the union being called the Dominion of Canada, with its capital at Ottawa. What advantages for this purpose do you see in the location of Ottawa? The satisfactory administration of the government has been one reason why so many people from other countries have migrated to Canada in recent years. The Prime Minister, who in many ways corresponds to our President, remains in power only so long as his government is approved by the people. A Governor-General, however, is appointed by the King of England. Thus Canada is a part of the British Em-

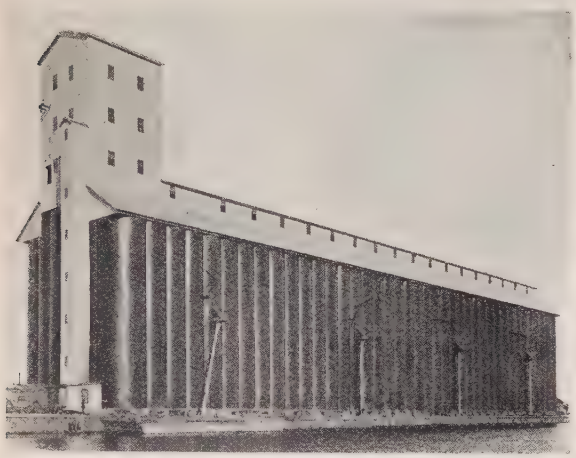
Character of the government

© *Keystone View Co., Inc.*

Fig. 207. — King Street, Toronto

In Fig. 32 note the importance of Toronto as a railway center; note also, on the table on p. 175, its population. What signs, if any, would you expect to see in Toronto of that city's connection with the British Empire?

pire. The pride that Canadians feel in this relation to England was well shown by the remarkable way in which they responded to the call of the mother country in the World War. Another bond between the two countries is a commercial one. Britain greatly needs the lumber, wheat, and other foodstuffs from Canada, while Canada needs English manufactures and English capital for the development of her new industries. To favor this trade, the tariff on goods imported from England is much less than that on similar goods imported from the United States. As a result, Canada's trade with Great Britain is greater than that with any other country except the United States.



© *Publishers' Photo Service*

Fig. 208. — A grain elevator at Fort William, Ontario

Locate Fort William on Fig. 206. What other port is near by? Where does the grain come from? Ocean vessels may load wheat at this elevator and carry the grain to Liverpool. Trace out the route on the map.

The other great aid toward unity is the transportation routes. One of these is the water route from Fort William to the ocean. Name and locate several large cities upon it. The fact that fine passenger steamers as well as freight vessels are used upon it greatly increases its influence in keeping the people of the provinces in touch and sympathy with one another.

Excellence of transportation routes

The chief means of communication, however, is the railways, two of which extend across the continent, a surprising fact in view of the population of only about 9,000,000. Canada has more than 40,000 miles of railroad, or more miles for each thousand of its inhabitants than any other country in the world except Australia (25,741 m.). That suggests the unusual energy and intelligence of its people. Several of the railroads are now owned by the Canadian Government. The government now controls 23,000 miles of railroad and 56,000 miles of telegraph lines. The Canadian Pacific Railway is the most important privately owned system, connecting St. John in New Brunswick with Vancouver in British Columbia, and having many branch lines. Name the leading cities on this line from Winnipeg westward. It also controls a fleet of more than sixty steamships which not only operate on Canadian inland waters but cross the Atlantic and the Pacific. Trace the routes of the Grand Trunk Pacific and the Canadian Northern Railway. The Hudson Bay Railway is under construction from the grain region to Port Nelson on Hudson Bay. It will shorten the distance to the Atlantic for the four western provinces by more than 500 miles. Mark out the route. The difficulty is that it can be used only two or three months of each year. Can you explain why the period is so short?

Possible growth of Canada in the future. — Canada's population according to the census of 1901 was 5,371,000. The figures at the beginning of this chapter, which are based on the government census of 1921 except in the case of Montreal, show a total of some-

what less than 9,000,000 at the present time. How much larger a population can Canada support?

© Brown Bros.

Fig. 209. — A portion of the railway yards at Winnipeg

Locate Winnipeg. It is one of the greatest railway centers of Canada. Do you see any similarity in its position to that of Chicago that accounts for its importance in this respect?

Probably little of the forest area will be denuded to permit agriculture (p. 176). Yet the forests themselves will bring great wealth. They stretch all the way from the Atlantic to the Pacific (Fig. 14), sweeping far north around the Prairie Provinces and averaging 200 to 300 miles in width. What is the prevailing type of tree? This timber has only begun to be used; and as the supply decreases in the United States and elsewhere, its value for lumber and pulp wood for paper will be high. Care must be taken, however, in the use of these forests to conserve the timber, for great stretches have been destroyed by fire; owing to the slow growth of forest trees caused by the shortness of the summers, it will take many years for a new growth of timber to replace this, or to attain a sufficient size for profitable lumbering.

Future uses of the forest area

1. For lumbering

This area will also be a great fishing and hunting ground; for fish abound in the thousands of lakes left by the Ice Sheet, and there is no other part of America save Alaska where large game is so abundant. Among the animals found here are deer, moose, bear, fox, wolf, wildcat, beaver, and mink. Furs will continue to be one of the important products, as they always have been. Fur farms are now being established in some districts and there is room for thousands of such farms in the region of thin soils.

2. For fishing and trapping

© Brown Bros.

Fig. 210. — A Hudson's Bay Company's trading post on the shore of Ungava Bay

Locate this bay on Fig. 206. Lonely trading posts like this are found widely scattered over the thinly settled portions of Canada. Can you find some on the map? To these the Indians bring their furs every spring and summer and take in exchange money and goods. The Hudson's Bay Fur Company established its first posts on the shores of Hudson Bay about 250 years ago.

Fig. 202 shows not only how rich southern Canada is in mineral products, but how little of the country

Possible increase in mining

has been explored for minerals. It is probable that many other deposits will be discovered both in the southern section and in the far North; and in this task, the Ice Sheet that did so much harm to agriculture will be a positive benefit. By removing the surface soil and rock it has made it easier both to find and to work the valuable minerals that lie underneath.

Possible increase in agriculture, grazing, and manufacturing

Agriculture promises to increase rapidly. Fig. 205 shows the area now devoted to wheat; but the more hardy grains, like oats and barley, and some vegetables can be raised still farther north. Little more than one tenth of the arable land in Canada has thus far been cultivated. The grazing industry is likely to be greatly expanded, and in the far North — north of the region of trees — hundreds of thousands of reindeer may find food, as many do to-day in Alaska (p. 172). Indeed, steps have already been taken to herd all the reindeer of the North into one district and to breed them for food purposes.

With increase of lumbering, mining, and agriculture, factories will naturally multiply, and thus the population will grow. One prominent authority expects not less than 80,000,000 inhabitants by the end of this century. How does this compare with the present population of the United States?

2. Newfoundland

	Area in Square Miles	Population	Largest City	Population
Newfoundland	42,700	258,000	St. John's	39,000
Labrador	120,000	4,000		

How the location of Newfoundland has influenced its development. — Newfoundland, with the Labrador coast, which is under its control, is a part of the British Empire; but instead of joining the Dominion of Canada it has been a separate dominion.

Its isolation from the rest of British North America

There has been talk about its uniting with Canada; but its location prevents rail connection with that country and it is even a long distance by boat from St. John's to any of the Canadian cities (Fig. 206). Estimate the number of miles to Halifax; to Quebec.

Its location has also greatly influenced its industries and its choice of countries for trade. Fishing is by far its most important occupation, more than one fourth of the entire population being engaged in it. The reason for its prominence is found in the nearness of the island to noted fishing grounds. Many varieties of salt-water fish live chiefly in the shallow waters of the ocean rather than in the deep parts. Along the coasts of Newfoundland and Labrador is a vast stretch of water only a few hundred feet in depth (Fig. 1), where cod, herring, and lobsters abound. Moss and other food for the fish are brought here by the icebergs from Greenland, that melt where they meet the warm current that sweeps by this coast (p. 243). These are the noted *Grand Banks*, which attracted fishermen from Europe hundreds of years ago and which are still among the best fishing grounds in the world. The only other prominent industry is the manufacture of wood pulp and paper.

The value of its fisheries

Since Newfoundland is nearer to Great Britain than any other part of North America, it sends a large proportion of its products there. It is also interesting to note that its trade with the United States exceeds that with Canada.

Its easy communication with Europe

Its location makes it very important in one other respect. Being the part of the continent that extends farthest east, it is the best place for the cable and wireless stations that secure communication with Europe.

In view of these facts, it is clear why nearly all the population is found along the southeastern coast. Note how many of the towns are there. Much of the interior is almost uninhabited.

© *Publishers' Photo Service*

Fig. 211. — A small tramp steamer in one of the fiords of Labrador

Labrador has little to export. Can you tell why? This steamer is taking on a load of whalebone, an accumulation of many years. These will be carried to Europe to be ground up for fertilizer. How many settlements does your map show along the coast of Labrador?

Facts to be especially well fixed. — 1. The temperature regions of Canada. 2. How the west coast differs from the interior in temperature and rainfall. 3. The four divisions of Canada and the character of each. 4. Location of Montreal; Quebec; Ottawa; Halifax; Toronto; Winnipeg; Calgary; Vancouver; Victoria. 5. Names and locations of the principal provinces. 6. The chief products of Ontario and Quebec. 7. Of the Prairie Provinces. 8. Of the Maritime Provinces. 9. Of British Columbia. 10. Of Newfoundland.

Problems for independent study. — 1. Make a drawing of the Great Lakes and St. Lawrence waterway and show the location of the canals. Locate the principal cities upon this waterway. 2. Why should not Canada have saved the enormous expense of building transcontinental railroads by merely running short lines southward to connect with our transcontinental roads? Scribner's, vol. 57, pp. 591–610. 3. Write an essay on the subject: Reasons for close friendship between Canada and the United States. Robinson, E.: *Commercial Geography* (1910), p. 252 (Rand McNally); Smith, J. R.: *Commerce and Industry*, p. 309 (Henry Holt); World Book, vol. 2, p. 1113. 4. Canadians hope to enlarge the canals in their great waterway so as to permit much larger vessels to reach Fort William. Do you see any effect this might have on Montreal? 5. Compare the area of the different provinces of Canada with that of Texas. 6. What parts of Canada are popular as summer resorts? Why? Look up advertisements of railroad and steamship companies in newspapers or magazines, and get special advertising booklets if you can. 7. What is a "factory" in the cold region of Canada? Who is the "factor"? Write a letter from such a "factory" that you are visiting, describing the life of the factor to a friend in your school. 8. Debate the question: *Resolved*, that Newfoundland should become one of the provinces of the Dominion of Canada. 9. Find the reason for the many fogs off the coast of Newfoundland and the dangers they cause to fishermen and ships. Allen, N. B.: *Geographical and Industrial Studies: United States*, pp. 290, 291 (Ginn); Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, pp. 111, 232 (Wiley); Coe, F. E.: *Our American Neighbors*, pp. 21–25. 10. Can you explain the natural reason for the boundary between Labrador and Canada? (See Fig. 206.)

VII. Countries South of the United States

Country, Island, or Archipelago	Form of Government	Area in Square Miles	Population	Largest City	Population
Mexico	Republic	767,200	14,235,000	Mexico City	633,000
The West Indies:					
Bahama Islands	British colony	4,400	53,000	Nassau	13,000
Cuba	Republic	44,200	3,369,000	Havana	539,000
Dominican Republic	Republic	19,300	897,000	Santo Domingo	31,000
Haiti	Republic	10,200	2,300,000	Port au Prince	125,000
Jamaica	British colony	4,400	858,000	Kingston	63,000
Lesser Antilles	Possessions of European nations	4,900	1,350,000	Port of Spain	64,000
Porto Rico	Dependency of U. S.	3,435	1,347,000	San Juan	71,000
Virgin Islands of the U. S.	Dependency of U. S.	132	26,000	St. Thomas	8,000
Central America:					
British Honduras	British colony	8,600	45,000	Belize	13,000
Costa Rica	Republic	23,000	507,000	San José	42,000
Guatemala	Republic	42,400	2,005,000	Guatemala	116,000
Honduras	Republic	46,300	673,000	Tegucigalpa	39,000
Nicaragua	Republic	49,200	638,000	Managua	60,000
Panama	Republic	32,400	442,000	Panama	59,000
Panama Canal Zone	Government possession of U. S.	554	27,000		
Salvador	Republic	13,200	1,580,000	San Salvador	84,000

1. Mexico

Questions. — 1. Compare Mexico with Texas in density of population. 2. Cuba is about the size of which one of our states? 3. Compare Porto Rico with Connecticut in area and population. 4. What appears to be the form of government of most of the Central American countries? 5. The population of the Canal Zone has greatly diminished. Find out why.

The most attractive part of Mexico.— In most countries the largest numbers of people congregate in the lowlands near the ocean. Most large cities have such a location. Give several examples. Yet that is not where they are found in Mexico. Fig. 10 shows little population on either coast. Nor are there many inhabitants in the broad northern part of the country. For hundreds of years the densest population has been in the neighborhood of Mexico City, which is some two hundred miles from either ocean. This is by far the largest city in Mexico. Note its population. Several of the other leading cities are not far distant from it. Name some of them.

Principal advantages of this section. — The principal advantage of this central section is its equable climate. **The temperature** Trace the tropic of Cancer across Mexico. Note that it is midway between the most northern and the most southern point in the country. This fact is significant. But since lines showing latitude take no account of altitude, they may give a false impression regarding climate. In Fig. 12 one can see the temperature regions in which Mexico lies. Along each coast there is a strip of lowland from ten to one hundred miles wide in the region that is *always hot*. Yucatan also is low, level land and very warm.

The interior of Mexico, on the other hand, is a vast plateau. In the north, near the United States boundary, this plateau averages about

5,000 feet above sea level; but toward the south it rises until a little south of Mexico City it is about 8,000 feet. The altitude of Mexico City itself is about 7,400 feet, and many of the other cities are over 6,000 feet above the sea. This region, as Fig. 12 shows, is in the area that is *always mild*. Do you wonder, then, that the Mexicans prefer the plateau to the hot lowland?

On the eastern and western margins of the plateau and nearly parallel with the coast are mountain ranges that come together just south of Mexico City in very lofty peaks. Popocatepetl, within easy view of Mexico City, is 17,888 feet in height, and Mt. Orizaba, the highest of all, is 18,701 feet. Fig. 215 shows how extensive is the area that is at least 5,000 feet in altitude. Among the mountains it is of course cool, and the snow never fully disappears from the higher peaks, even though they are in the tropics.

Fig. 13 shows that the rainfall on the plateau in the extreme north is very light, like that in the United States across the border. But toward the south it increases so that much of the southern half of the country has at least thirty inches, or enough for ordinary agriculture; and in some places where rain is lacking water for irrigation can be obtained from the mountains, though much less is available than in the United States. Here, then, is another explanation of the denser population of this region.

The rainfall

Some of the lowland along the eastern coast has a moderate to heavy rainfall and, being hot, has a wet, tropical climate. The rainfall of Yucatan, however, is barely sufficient for agriculture, and the variety of crops is limited. The distribution of rain in Mexico is easily understood if one considers the position of the country with respect to the belts of winds. The southern part of Mexico is in the belt of the northeast trades, which give rain only when they rise over highlands. Yucatan is therefore dry, while the east slope of the highlands is moist. Northern Mexico is in the horse latitude belt of calms (p. 233) most of the year and on this account gets little rain; but in the summer the equatorial rain belt shifts northward and covers much of Mexico. The rainy season is therefore in the summer, and of brief duration in the northern section. The rain on the southwestern coast comes from winds that blow landward from the Pacific.

© *Underwood and Underwood*

Fig. 212. — A fruit market at Cordoba, Mexico

Cordoba is on the inner edge of the coastal lowland bordering the Gulf of Mexico. The fruit for sale is the product of a tropical region. What kinds do you see?

Products that Mexico might supply. — Variety of climate means variety in native

plants and agricultural products. This advantage Mexico enjoys to an unusual degree. In traveling from one coast to the other, one experiences greater changes of temperature than in crossing our entire country from north to south. Our principal grains; the crops characteristic of our Southern States; semi-tropical fruits; many tropical fruits and trees — all these flourish in Mexico.

© Detroit Publishing Co.

Fig. 213. — A view over a part of Mexico City

The buildings are, as you might expect, Spanish in character.

Great quantities of food could easily be produced. Mexico has about one fourth of the area of the United States, and large sections are very fertile. Mexico could easily raise enough agricultural products not only to supply her own needs but also to export large amounts to other countries.

In addition to its agricultural possibilities, the Mexican plateau is one of the greatest mineral regions in the world.

Difficulties in the way of production. — With such natural advantages, what are the difficulties in the way of extensive production?

One difficulty is the lack of education. Less than twenty per cent of the people are white. These whites speak Spanish, and many of them are highly educated. Some of the others, also, are well educated, especially in the cities. Mexico City shows many evidences of modern ideas, such, for example, as fine houses and public buildings, good pavements, modern lighting, adequate water systems, and electric railways. Most of the natives, however, are ignorant Indians or people of mixed blood. Spanish is the language of the educated, but among the uneducated more than fifty dialects are used. Thus the masses are divided into groups that cannot easily communicate with one another.

Lack of education

Moreover, a large percentage of the adults are unable to read. They are ignorant of many of the simplest facts about how to live and how to work. For instance, the houses have frequently only one room, in which the family cooks, eats, and sleeps. The food is of the crudest sort; men and women go barefoot a great deal; and one can still see the wooden plow, which only scrapes the ground, and the two-wheeled cart with solid wooden wheels, drawn by oxen.

Few of the mines are worked by modern machinery. In many of them the ore is raised from the shafts in rawhide buckets with a windlass worked by a mule, and the metal is separated from the ore by an old-fashioned process. The foreigners, of course, who have

investments there and the educated Mexicans of Spanish descent work in a very different fashion; but the others make up the larger part of the population. Under such circumstances farms and mines produce only a small fraction of what they ought to produce.

A second difficulty is the unstable government. Mexico is a republic, modeled after our own, having twenty-eight political divisions similar to our states and two territories, with Mexico City as the capital. But there is frequently disorder and civil war has been common. Fields have lain idle, towns have been burned, and factories have been destroyed or abandoned, while bands of armed men have gone up and down the country, living upon what they could take from the people. The government has not been strong enough at times to preserve order.

Weakness of the government

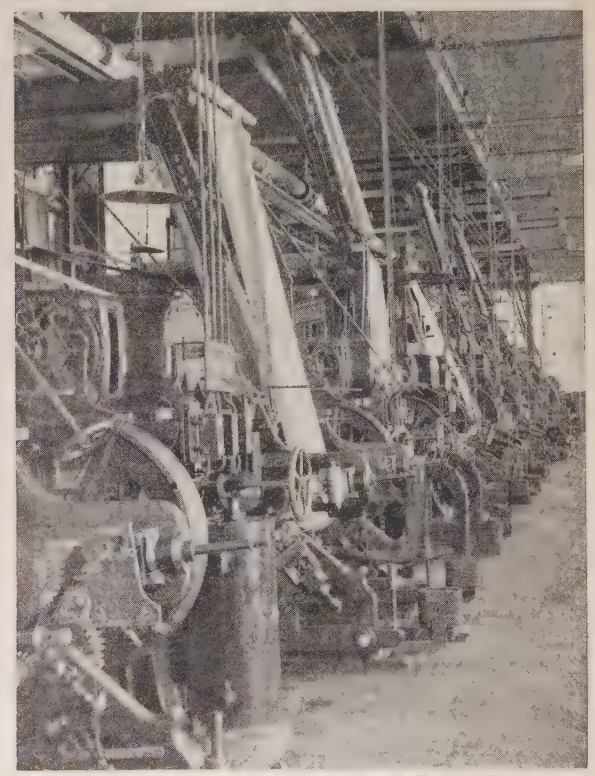
Certain arrangements in regard to land and labor have had a further bad effect upon production.

In our own country the public lands have been given to settlers in small amounts, usually 160 acres, or a quarter of a square mile. The owner has made such a farm his home, and because he owned it and might eventually buy more land, he has worked harder than he would otherwise have done and has been interested in good government, good schools, and public improvements.

Poor laws regarding land and labor

In Mexico a different plan has been followed. In the days when Spain controlled the land, enormous areas were granted to Spanish subjects for money or as a reward for public services. In north central Mexico is one of the largest of these estates, called the Hacienda Cedros (Fig. 216).

Labor laws have worked hardships for the poor man; for they have compelled one who was in debt to work for his creditor until the debt was paid. The wage received is usually low; and there is little hope of improving one's condition, even after one gets out of debt. So the debtor spends his life in servitude, more or less hopeless or shiftless.



© *Keystone View Co., Inc.*

Fig. 214. — Printing room in a cotton mill at Orizaba, Mexico

Before the late wars in Mexico nearly 150 cotton mills were in operation. Some of the more modern mills were at Orizaba, Mexico City, and Puebla. One mill at Puebla employed 2,000 workers. Why is cotton worn more than woolen in Mexico?

Such people are called *peons* — a peon being a man bound out to work for his creditor; much of the labor in Mexico was performed under this *peonage* system. These conditions are gradually being changed by new land and labor laws.

Lack of easy means of transportation is a fourth serious obstacle to production. Mexico has only about 16,000 miles of rail-

MEXICO, CENTRAL AMERICA, AND WEST INDIES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300 400 500
Capitals of countries
Railroads
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
Below sea level
The states of Mexico not named are shown by numbers thus:
1. Aguascalientes
2. Federal District
3. Mexico
4. Morelos
5. Queretaro
6. Tlaxcala
PORTO RICO AND THE VIRGIN ISLANDS
Scale of statute miles
0 10 20 30 40 50
ATLANTIC OCEAN
CARIBBEAN SEA
PACIFIC OCEAN
GULF OF MEXICO
GULF OF CAMPECHE
San Juan
PORTO RICO
Ponce
Humacao
Aguadilla
Mayaguez
Camuy
MONA ISLAND
C. Rojo
Guayama
CULEBRA
VIRGIN ISLANDS OF THE UNITED STATES
VIEQUES I.
ST. JOHN I.
ST. THOMAS I.
ST. CROIX I.
Christiansted
Frederiksted
Longitude West
120° 116° 112° 108° 104° 100° 96° 92°
32° 28° 24° 20° 16° 12° 8° 4°

Fig. 215

ATLANTIC OCEAN
CARIBBEAN SEA
WEST INDIES
CENTRAL AMERICA
Nashville
Knoxville
Raleigh
C.Hatteras
Wilmington
C.Fear
Columbia
S. CAROLINA
Augusta
Atlanta
Macon
GEORGIA
Charleston
Savannah
Jacksonville
Tallahassee
C.Canaveral
Tampa
BERMUDA IS. (Br.)
GREAT BAHAMA I.
GREAT ABACO
NEW PROVIDENCE I.
ANDROS ISLANDS
Nassau
CAT I.
SAN SALVADOR I. (WATLING I.)
LONG I.
CAICOS IS.
TURKS IS.
Florida Strait
Key West
C.Sable
Tropic of Cancer
Havana
Matanzas
Cardenas
Pinar del Rio
Bahia Honda (U.S. Coaling Sta.)
ISLE OF PINES
Cienfuegos
Santa Clara
Sancti Spiritus
Camaguey
Manzanillo
Guantanamo
Cape Haitien
HAITI
DOMINICAN REPUBLIC
Windward Passage
Santiago de Cuba
Guantanamo Bay (U.S. Naval Sta.)
JAMAICA (Br.)
Kingston
Port au Prince
Santo Domingo
Mona Passage
PORTO RICO (U.S.)
Ponce
San Juan
Guayama
VIRGIN ISLANDS (Br.)
Anegada Passage
ANGUILLA I. (Br.)
BARBUDA I. (Br.)
ST. KITTS I. (Br.)
ANTIGUA I. (Br.)
GUADELOUPE IS. (Fr.)
DOMINICA I. (Br.)
MARTINIQUE I. (Fr.)
Fort de France
ST. LUCIA I. (Br.)
BARBADOS I. (Br.)
Bridgetown
ST. VINCENT I. (Br.)
GRENADINES IS. (Br.)
GRENADA I. (Br.)
TOBAGO I. (Br.)
Port of Spain
TRINIDAD I. (Br.)
ARUBA I. (Dutch)
CURAÇAO I. (Dutch)
BONAIRE I. (Dutch)
Pt.Gallinas
MARGARITA I. (Ven.)
TORTUGA I. (Ven.)
La Guaira
Caracas
Puerto Cabello
Lake Maracaibo
Gulf of Venezuela
Santa Marta
Barranquilla
Cartagena
Orinoco R.
VENEZUELA
COLOMBIA
Medellin
Bogota
ANDES MTS.
Magdalena R.
Gulf of Darien
Panama
Gulf of Panama
ISTHMUS OF PANAMA
PANAMA CANAL ZONE
Panama Canal
Colon
Limon
Puntarenas
San Jose
COSTA RICA
NICARAGUA
Lake Nicaragua
C.Gracias a Dios
Mosquito Coast
CORN I. (U.S.)
HONDURAS
Cortes
Yucatan Strait
BRAZIL
WILLIAMS ENGRAVING CO., N.Y.
84°
80°
76°
72°
68°
64°
60°
56°
32°
28°
24°
20°
16°
12°
8°
4°

Fig. 215

Questions on Fig. 215. — 1. Contrast the railroad mileage in the United States with that in the countries south of it. Explain the difference, and show its probable effects on the industries of these countries. 2. In what direction do vessels go in passing through the Panama Canal from the Atlantic to the Pacific (see also Fig. 227)? 3. Point out the island on which Columbus is thought to have made his first landing in America. 4. Show that in the West Indies or in Central America south of the Isthmus of Tehuantepec one is rarely more than 100 miles from the sea.

---

way, which is about one fourth of our average for the same area. This leaves many points, even in the best part of the country, from fifty to a hundred or more miles from the nearest railroad. Fig. 215 shows the railways, and you can test these distances by using the scale on the map. Locate the Tehuantepec Railway. What reason do you see for its special importance in the past?

Lack of transportation facilities

Mexico has no such system of waterways for transportation of goods as has the United States. Most of the rivers are short, for they flow down the steep slopes of the plateau to the sea on the east and west. They are so swift and have so many rapids and falls that they are generally useless for navigation.

Most of the harbors, also, are poor. The two principal ports on the eastern coast are Vera Cruz and Tampico, both of which depend upon breakwaters for the protection of vessels. The best harbor is Acapulco, on the western coast; but it has rugged land to the east, and little commerce. Find each of these on the map.

Wagon roads are as important for prosperity as railroads. It is an enormous task to build good roads in any "new" country. In Mexico, where much of the surface is rough and mountainous, little work on road building has ever been done outside the cities. In consequence, people in the country depend largely on trails; and donkeys and pack horses take the place of wagons. The small sure-footed burro is seen everywhere, although he is slow and carries only light burdens. In the time of the Aztec Indians it is said that swift-running men in relays delivered fish from Vera Cruz to Mexico City, 260 miles distant, within twenty-four hours after the fish had left the water. What rate of travel would that be? Indian runners are still used for carrying messages and merchandise long distances.

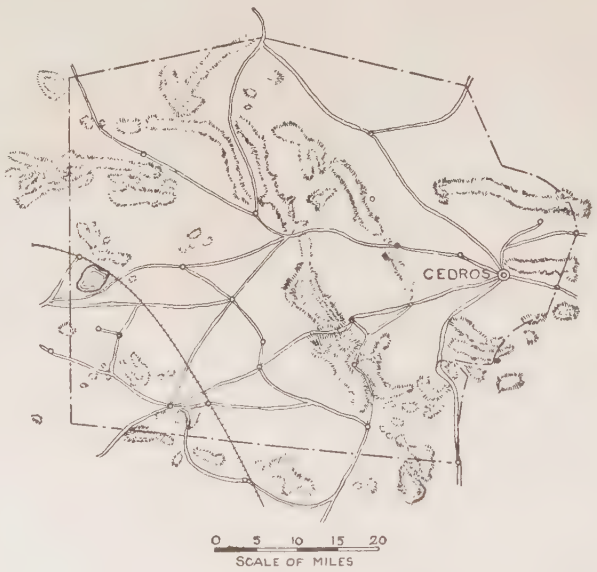


Fig. 216. — Large estate, *Hacienda Cedros*

By use of the scale estimate the dimensions and area of this estate. The principal village consists of the Manor House where Cedros, the first owner, lived; a church; an ore mill and smelter; corrals for cattle; and adobe huts for the workmen. The Manor House has adobe walls four feet thick, and is built around a court sixty or seventy feet square. The rooms have tiled floors and huge hewn beams in the ceilings. The irrigated garden adjacent to the house includes forty acres and is inclosed by a wall ten feet high.

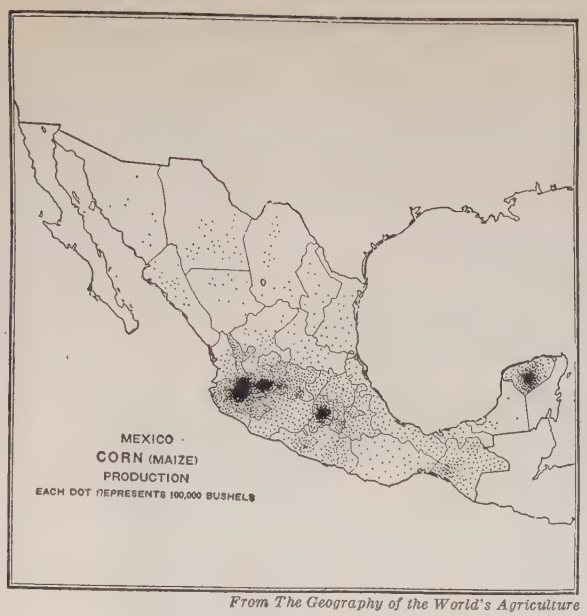
When means of transportation are so poor, many sections cannot obtain the tools and raw materials needed for the simplest industries; nor can they market their farm and mining products easily. Thus both trade and

manufacturing are carried on at a disadvantage.

The leading industry is agriculture, yet only about one fifteenth of the total area is under cultivation. On the southern portion of the plateau, where the rainfall is sufficient for agriculture or water for irrigation can be obtained from the mountains, wheat, barley, corn, and beans are raised. Corn (Fig. 217) and beans are the commonest foods of the inhabitants. Fruits, such as apples, pears, peaches, and grapes, are also grown.

Importance of agriculture and grazing

1. On the plateau



From The Geography of the World's Agriculture

Fig. 217

Long before Europeans reached North America corn was grown for food by the Indians of Mexico. Corn to-day is the leading crop in Mexico. Why is it so little grown in the northern portions of the country?

Two species of plants in the arid sections are of special importance. One is the *agave*, a kind of century plant, whose juice is made into *pulque*, the national alcoholic drink of the working class, and into another beverage called *mescal*. The other is the *guayule*, a scrub plant reaching a height of three or four feet and valuable for rubber. It is especially important because it is a rubber plant that thrives in a region where white men can live.

Most of the vast arid section of northern Mexico is given up to grazing, like the land in some of our states across the border. In this region Americans are especially active, owning some very large estates.

Corn and beans are common on the slopes and hot lowlands, as on the plateau. Other important lowland products are cotton, sugar, coffee, indigo, cocoa, rice, potatoes, and rubber; also a great variety of fruits, such, for example, as the banana, pineapple, orange, and lemon. Foreigners are developing sugar, coffee, and rubber plantations extensively on the tropical lowlands. In Yucatan, henequin, or *sisal*, from which binding twine is made, is the great crop. This plant is a kind of agave, somewhat like that raised on the plateau. Grazing is important in Yucatan. Why is agriculture limited in that section?

2. On the slopes of the plateau and on the lowlands

There are over 2,000 mining properties in Mexico; about five sixths of which are silver mines. For 400 years the plateau has been the greatest silver-producing region in the world; and it still supplies more than one third of the world's output of that metal. The gold output is about one half as important. A great iron mountain near Durango, which is said to contain 300,000,000 tons of excellent iron ore, is now being mined extensively under the control of Americans. These mines are connected by rail with the railways of the United States.

Importance of mining

The only mineral of importance in the lowlands is oil. The principal oil districts are those about Tuxpam and Tampico. Near Tampico about 5,000,000 acres of land

are held for oil purposes. How does this compare with the area of Connecticut? The oil industry is a very recent development. In 1900 only 1,000,000 barrels were produced, while in 1923 the production was over 150,000,000 barrels. One well near Tuxpam, undoubtedly the largest in the world, has produced as much as 260,000 barrels in a day. There are more than 300 productive wells in Mexico, most of which are under the control of the English and Americans. During the World War the Tampico fields were the main source of supply for the British war vessels. Several tank steamers leave Tampico every day.

© Keystone View Co., Inc.

Fig. 218. — Sisal hemp on the wharf at Progreso, Mexico

Locate Progreso. Where does this hemp come from? To what port in the United States will it probably go?

Minerals make up much more than one half the exports — silver, gold, copper, and oil being most prominent. Not many products of the soil are exported; among the most important are sisal, hides, and vegetables. The fact is that owing to the difficulties in the way of production the vast majority of the people are not producing enough materials for food, shelter, and clothing to enable them to live comfortably themselves, to say nothing of exporting surplus products to other countries.

Exports

Why the United States is anxious for improvement in Mexico. — Since the United States is so close at hand, it is naturally the principal country with which Mexico trades. In fact, in 1924 her trade with the United States was several times as great as that with all other countries combined. Though we thus practically monopolize trade with Mexico, the actual amount ought to be far greater. We should like more of her metals, her cattle and hides, coffee and rubber. We are especially anxious to get her binding twine, for our farmers suffer seriously when there is a shortage of hemp. In return, since we manufacture so extensively and Mexico so little, we can well send her machinery, cotton goods, and furniture. Both nations would be more prosperous if such exchange were increased; but it cannot take place until the conditions in Mexico are improved. From what ports in Mexico could some of the products be shipped? What railroad routes might well be followed? What ports in the United States would be likely to be used in shipping goods by water to Mexico?

Need of more trade between the two countries

The lack of education of the masses of the people in Mexico has often made it difficult for them to choose their leaders intelligently or to follow them loyally

Why this is difficult

after they are chosen. The Government of Mexico, in fact, has been in an unsettled state most of the time until recently. The lives of foreigners have often been in danger; property which they have spent large sums in developing has been taken away from them; and in many other ways they have been made to feel that they are not welcome.

This is doubly unfortunate, for a backward country like Mexico is in great need of foreign wealth to develop its resources. On the other hand, the rest of the world, including our country, needs Mexico's spare products.

In recent years there has been much improvement, and the United States now deals with Mexico as a friendly and reliable country. Nevertheless, many of the people of each country have a lack of respect for those of the other which seriously interferes in their dealings. The Mexicans, like many people who live in and near the tropics, dislike our hurry and energy and feel that we may be trying to take advantage of them. And our own people have not always tried to understand the views and feelings of their neighbors. Now that foreigners' lives and property are again reasonably safe in Mexico, it is to be hoped that the Mexicans and Americans will greatly increase their friendship and trade.

Facts to be especially well fixed. — 1. Where the Tropic of Cancer crosses Mexico. 2. The name and location of the principal city and of the three main ports. 3. The location of the highlands and lowlands. 4. The distribution of rainfall. 5. The location of the temperature belts. 6. Agricultural products. 7. Mineral products.

Problems for independent study. — 1. Would you expect clothing and shelter to be more or less expensive in Mexico than where you live? Why? World Book, vol. 5, pp. 3765–3766; Herbertson, F. D. and A. J.: *North America*, pp. 217–219 (Black).

© *Publishers' Photo Service*

Fig. 219. — A rope and twine factory in Yucatan

In the foreground are seen coils of sisal fiber to be twisted into rope and twine. Much of the sisal of Yucatan is exported in an unfinished condition to factories in the United States.

2. The coal mined in Mexico is about one seven-hundredth that mined in the United States and but little is imported. What does this fact tell you about the development of the country? What industries would probably be lacking? Write to the Pan-American Union, Washington, D. C., for the pamphlets, *Mexico, a Review and a Forecast*, and *Mexico, General Descriptive Data*. National Geographic Magazine, 1919, vol. 36, pp. 307–330. 3. Why is it generally inadvisable to farm fifty or a hundred miles from a railroad? 4. There has been some talk about a canal across the Isthmus of Tehuantepec. What advantages do you see in that location over the Panama Canal? What disadvantages? Encyclopædia Britannica, vol. XX, pp. 668–670. 5. Acapulco has, perhaps, the finest harbor on the western coast of North America south of San Francisco. What is its prospect of becoming a great port? How does its prospect compare with that of Vera Cruz, whose harbor is very poor? Why?

World Book, vol. 5, p. 3767; New International Encyclopedia, vol. 15, p. 535; Winslow, I. O.: *Our American Neighbors*, p. 59 (Heath). 6. How many railroads lead from Mexico into the United States? Can one go from New York to Mexico City by rail? Smith, J. R.: *Commerce and Industry*, p. 315 (Henry Holt); Whitbeck, R. H.: *High School Geography*, p. 432 (Macmillan). 7. Watch for printed articles and talk with well-informed persons about changes in governmental affairs in Mexico. Does the country appear to you to be becoming more stable? Justify your answer. 8. Draw an outline map of Mexico from memory. Insert the names of as many mountains, states, and cities as you can. 9. Would it be advisable for us to make Mexico a part of the United States, if the Mexicans desired it? World Book, vol. 5, p. 3771; World's Work, vol. 38, pp. 572–574. 10. What parts of the United States were formerly parts of Mexico? What traces of former Mexican occupation can you point out? Consult your textbook in American history.

2. West Indies

Ownership of these islands. — Of the four largest islands, called the Greater Antilles, Cuba is an independent republic; Haiti is divided into two republics, that of Haiti on the west side and the Dominican Republic on the east; Porto Rico is a possession of the United States; and Jamaica is a British colony. The other islands, or Lesser Antilles, are divided among various countries, especially Great Britain, France, and the United States. Look these up on Fig. 215.

Interest of the United States in the West Indies. — While Great Britain owns by far the largest number of islands among the West Indies, including all the Bahamas, the country most interested in this region and most influential here is the United States.

This interest is partly military. We have so long a coast line facing the Gulf of Mexico that it is important for us to control the entrance to the Gulf as fully as possible. Estimate, from the map, the length of this coast. Now that we have built the Panama Canal, it is also necessary for us to be able to protect it from rivals and from possible attack in case of war.

Our military interest

With this aim in mind we have erected fortifications at the entrances of the canal; have purchased the rights to the Nicaragua route, so that the United States is the only nation that can dig a canal there; and have leased two bases in Cuba that give us control of the channels at the east and west of that island. Our ownership of Porto Rico gives us command of the channel just west of it; and our purchase from Denmark in 1917 of some small islands east of Porto Rico, now called the Virgin Islands of the United States, gives us an additional advantage.

The chief city of the Virgin Islands, St. Thomas (Fig. 215), has one of the finest harbors in the world and lies at the point where two great steamship routes cross one another — one from Liverpool to the Panama Canal, and the other from New York to South America (see Fig. 495). It is of value both as a base for our navy and as a coaling station for our merchant vessels. Owing to its favorable location it has been called the keystone of the arch of the West Indies.

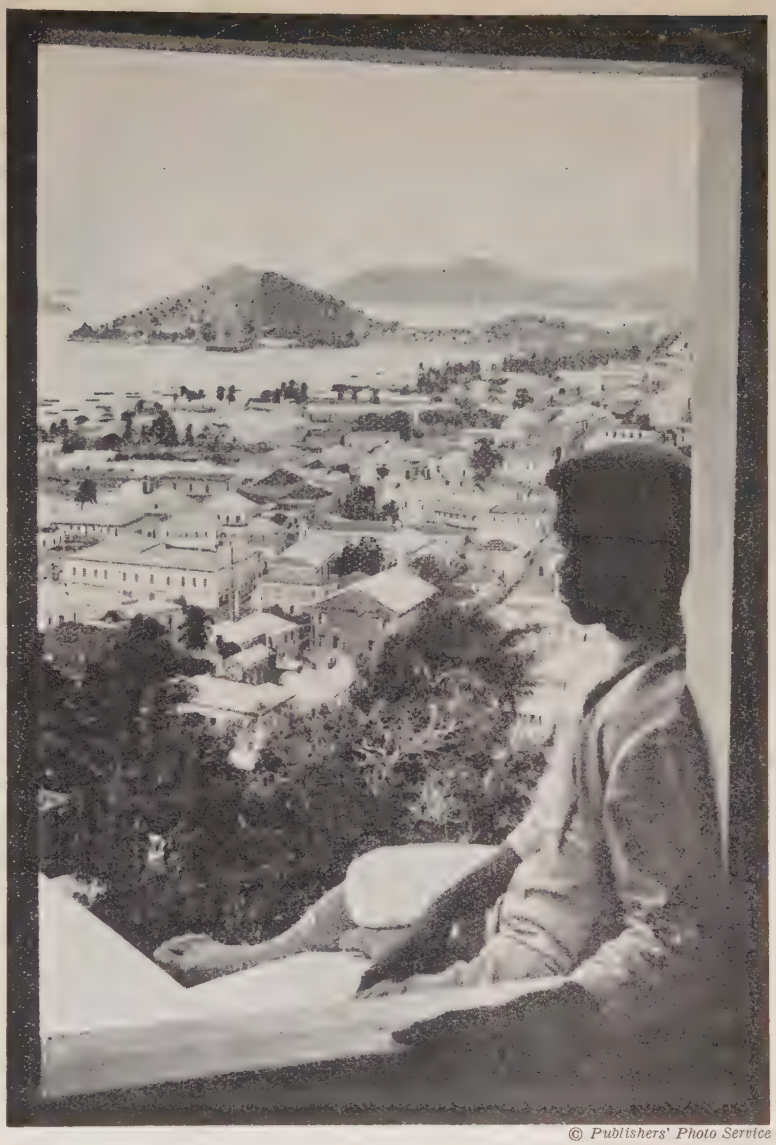
Our other interest in the West Indies is a commercial one. Our nearness to these islands and our importance among nations cause their inhabitants to look to us for aid when serious difficulties arise in their finances or grave disorders in their government. Still more important, however, is our relation to them as the natural market for their products.

Our commercial interest

The sameness of climate throughout the islands leads them all to grow similar crops and to import the same kinds of articles

from abroad. Their foreign trade, therefore, must be with distant lands rather than with one another. On the other hand, we are in special need of tropical products, since we cannot grow many of them ourselves. We are also a great manufacturing nation, while they must import many of their manufactured goods. For these reasons and because we are so near, their trade is mainly with us.

Variety and quantity of products from the West Indies. — Excellence of the climate for tropical products The climate is very favorable for agriculture. Most of the islands are mountainous, some of the peaks being 8,000 to 10,000 or more feet in height. In what temperature region are these islands? There is some variety of temperature, according to altitude. Rain is abundant in most sections, but the rainfall is especially heavy on the windward slopes of the mountains, where the moist trade winds are forced to rise (p. 235). In the larger islands these winds are from the northeast; in the Lesser Antilles they blow from the east and southeast. The location of the West Indies places them beyond the reach of the cold north winds that occasionally do so much damage to the subtropical plants in our Southern States.



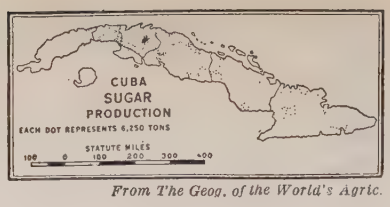
© *Publishers' Photo Service*

Fig. 220. — The harbor of St. Thomas

Until recently the city of St. Thomas was known as Charlotte Amalie.

Sugar is the leading product, being raised on most of the islands. Cuba in some years leads the world in its production. Yet the area there under cultivation for sugar is only about one tenth of what it could be. If all the land available were used, Quantity of sugar Cuba alone could undoubtedly supply the present world demand for sugar. Even as it is, it produces in some years more than ten times as much cane sugar as the United States. Porto Rico, less than one tenth as large as Cuba, produces from two to

three times as much as our Southern States. The fact that their freedom from frost makes it unnecessary to plant new cane for each crop is the greatest advantage that these islands enjoy over our country for cane-sugar production (p. 107). Fig. 221 shows the location and amount of sugar production in Cuba. See also Fig. 489.



From The Geog. of the World's Agric.

Fig. 221

The world's supply of bananas could also be secured from these islands. Bananas are a comparatively new article of food in the United States. Before 1870 few Americans had ever seen a banana; but we now consume about 50,000,000 bunches per year from Central and South America and these islands.

Other agricultural and forest products

While Brazil leads the world in the production of coffee, about one fifth of the world's supply comes from the countries bordering the Caribbean Sea. Haiti raises a larger quantity than any of the other islands, but the best quality comes from Jamaica. The United States is encouraging the production of coffee in Porto Rico.

Some of the best tobacco in the world comes from western Cuba. A considerable portion of this is manufactured into cigars and cigarettes in Havana. Every one has heard of the Havana cigar. Tobacco is one of the most important products of Porto Rico also; a very large number of cigarettes is manufactured there. Many other agricultural products are raised in these islands, such, for example, as pineapples, coconuts, and spices. Fruits and vegetables are grown extensively for our winter market. Different kinds of wood also are abundant, particularly cabinet woods and dyewoods.

The precious metals have been mined, but iron ore and copper much more extensively. Cuba is richest in ores; she is now sending iron ore to steel centers in Pennsylvania and it is expected that shipments will be made to Great Britain in the near future. The most interesting mineral product of the West Indies, however, is *asphalt*. There is an entire lake of it on the island of Trinidad, near the coast of South America. It is cut from this lake in large chunks for shipment abroad, especially to the United States, where it is extensively used for street paving and in the manufacture of roofing.

Production of minerals

© *Underwood and Underwood*

Fig. 222. — A tobacco plantation near Havana
Note the banana trees in the background.

While the production of all these commodities can be

greatly increased, this is likely to come about slowly. Every region has its drawbacks, and those hindering production in these islands are numerous. The heat is steady and oppressive, in spite of the moderating influence of the ocean; tropical diseases are always threatening; there are many insect pests; violent storms and hurricanes are frequent; destructive earthquakes are not infrequent; and, worst of all, a majority of the people are densely ignorant. Yet the demand for West Indian products is bound to increase, and progress, even though slow, is therefore assured.

Difficulties in the way of production

© *Publishers' Photo Service*

Fig. 223. — Digging asphalt on the island of Trinidad

Locate Trinidad. The asphalt is dug from a lake of asphalt the surface of which is hard enough to support even a light railroad. Beneath the crusted surface is the thick liquid asphalt, which hardens slowly as the hard surface is removed.

Our close relations with these islands. — One fact which encourages close relations between these islands and the United States is the ease with which commerce between the two can be carried on. It is an easy voyage from our eastern ports to Havana, by far the largest city in all the islands; indeed, the trip can be made almost entirely by land, since trains run southward all the way to Key West in Florida (Fig. 215). Estimate the distance from there to Havana. Note how directly south from New York the West Indies lie. Estimate the distance from New York to Kingston in Jamaica; to San Juan in Porto Rico. Most of the harbors of the larger cities are excellent, and in some of the islands within recent years there has been much improvement in

Fig. 224. — A wharf on the water front at Havana

What are the principal exports and imports of Cuba? Most of them pass through Havana.

Fig. 225. — A portion of the city and harbor of San Juan, Porto Rico

the highways and railroads. The United States has brought about a great improvement in the transportation facilities in Porto Rico, and has exerted a good influence in this respect over Cuba; and Jamaica, which supplies us with large quantities of tropical fruit, is well provided with roads and railways.

Facts to be especially well fixed. — 1. The names and location of the four largest islands. 2. Why the United States is especially interested in the Caribbean region. 3. The leading products of the islands. 4. Location of Havana; Santiago; Kingston; San Juan; Ponce; San Domingo; Port au Prince; Port of Spain.

Problems for independent study. — 1. The Caribbean Sea is sometimes called the American Mediterranean. To what extent is this a fitting name? Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, p. 61 (Wiley); Trotter, S.: *Geography of Commerce*, pp. 200–203 (Macmillan). 2. Do you think that it would be advisable for a young man or woman from the United States to go to one of these islands to live? Why? National Geographic Magazine, 1920, vol. 38, pp. 1–30; Chamberlain, J. F., and Chamberlain, A. H.: *North America*, rev. ed., Chapter XXII (Macmillan). 3. The plantation method of farming is in some ways preferable to the method common in the United States by which a farmer cares for a small farm with but little help. Why? 4. In the West Indies the demand for manufactured goods from the United States is far less than it would probably be from the same number of people living in a temperate climate. Why? 5. Columbus, when he discovered America, landed on one of the Bahama Islands. Can you explain how he happened to reach this latitude? 6. What advantages and what disadvantages do you see in these islands as winter resorts? 7. The Bermuda Islands lie far to the east of South Carolina. Find out what their attractions are. Mill, H. R.: *International Geography*, pp. 708–709 (Appleton); Chamberlain, J. F., and Chamberlain, A. H.: *North America*, revised, Chapter XXII.

3. Central America

Similarity of conditions to those in Mexico. — There is a striking similarity between conditions in these countries and those in the southern portion of Mexico. The mountains of Mexico extend on through Central America; and while all these countries lie in the tropics, the inhabitants avoid the extreme heat by locating their homes mainly on the highlands, as in Mexico. This places most of them near the Pacific coast. In Fig. 10 note how few people are found on the lowlands along the Gulf coast.

The northeast trade winds bring a heavy rainfall, especially along the east coast and on the eastern mountain slopes. At one point near the boundary between Nicaragua and Costa Rica there is on the average 100 inches of rainfall in a year. Compare that with the rainfall in your own state. Natu-

rally the vegetation is luxuriant. The dense tropical forests that occupy a large part of the land contain mahogany, rosewood, logwood, and other valuable cabinet and dyewoods. The agricultural products, also, are similar to those in southern Mexico; and minerals are likewise abundant.

As in Mexico, however, the mass of the people are ignorant, the governments are weak, and means of transportation are poor.

Attempts at a union of these countries. — Although the area of all Central America is smaller than that of Texas, it contains more political divisions than all the rest of the mainland of North America. Note their names and locations on Fig. 215. How many are there?

British Honduras is a British colony, and the Panama Canal Zone belongs to the United States. One might suppose that the others — all of which are republics — would be eager to form a union like our own. Indeed, such a union did exist from 1821 to 1845. Yet it was discontinued, because the various states could not agree with one another. A new plan for union has recently been made. The extent of their isolation from one another is surprising. There is not now a single railroad crossing the boundary from one of these countries into another. Naturally, they have found it difficult to understand or trust one another, and wars have therefore frequently occurred.

The questions of chief interest to us in this region. — Our chief interest in Central America concerns the Panama Canal. Why did we want the canal? And of what value is it to Central America?

Plans for a canal across the Isthmus of Panama began to be considered more than 400 years ago. The need was felt keenly when the Spanish transported treasure from Peru across the isthmus on mules. As many as 2,000 mules were used at a time for that purpose. It was again felt to be a very pressing need when people had to travel to California by way of Central America at the time of the gold rush of 1849. This need was felt still more at the time of our war with Spain in 1898, when merchant vessels and warships had to pass all the way around South America in order to go from one of our coasts to the other. The belief finally became general that we, ourselves, must build the canal, no matter how much labor and money it might cost.

The need of a canal across the isthmus

© *E. M. Newman*

Fig. 226. — A typical oxcart in Central America

The oxcart is a symbol of undeveloped land transportation. There are few railroads in Central America. Trace them on your map. Highways are few and poor except near a few cities.

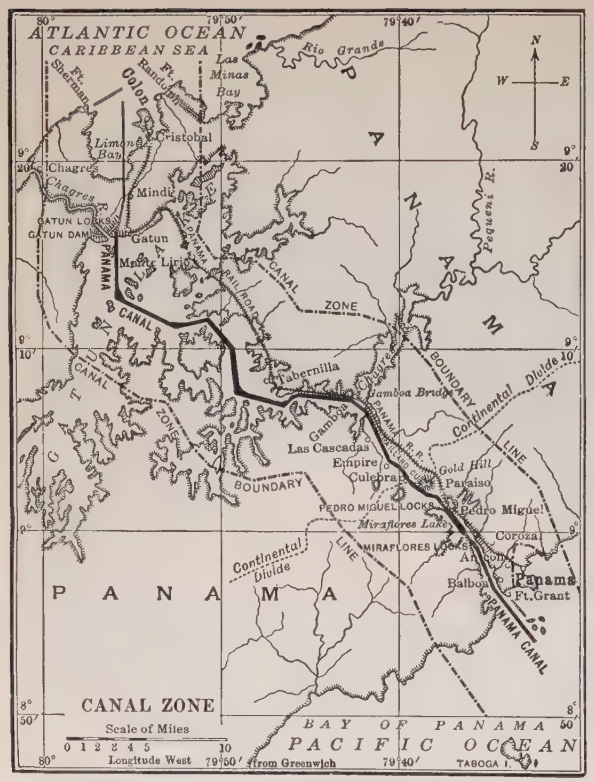


Fig. 227. — The Panama Canal Zone

The site selected is near the narrowest part of the isthmus. Measure the length of this strip on Fig. 227. This district is known as the Panama Canal Zone. It is leased from Panama by our government and is fully under the control of the United States, with some exceptions in the case of the cities of Colon and Panama. Locate these (Fig. 215).

The site selected

One of the greatest difficulties in building the canal was the menace to health in the wet, tropical climate, particularly danger from the plague, malaria, and yellow fever. Accordingly, the first great step in the task was to exterminate as completely as possible animals that spread pestilence, such as rats, fleas, and mosquitoes; to make the buildings rat proof; to provide good drinking water; and to make other conditions sanitary. Panama City and Colon had long ranked among the worst pestholes in the world, and it had been supposed that such conditions were unavoidable in that climate. But they were soon made as healthful as many of our own cities.

Some of the difficulties that were met

Another difficulty consisted in the fact that it was necessary to cut through the Western Cordillera, which, though only about 400 feet high at this point, presented a serious obstacle. This was overcome partly by a deep cut and partly by so constructing the canal that all vessels are lifted eighty-five feet above the level of the sea in passing through it. This required enormous locks near each end, which were very difficult to construct.

The canal was completed in 1914, having been built in ten years at a total cost of $367,000,000. The greatest single advantage to the United States is, probably, the fact that the distance by water between our eastern and western coasts is tremendously reduced; for example, that between New York City and San Francisco is reduced to 6,100 miles, which is considerably less than one half the former distance. The distance from New York to the west coast of South America is, likewise, greatly reduced; for that coast can now be reached by sailing almost directly south from New York, instead of going around South America and coming up on the west side. Trace this course. Make a rough estimate of the distance saved in going from San Francisco to Liverpool (Fig. 495).

Benefits of the canal

The influence on Central America itself is marked. The highlands there, on which the majority of the inhabitants live, are near the west coast. Most goods that are exported or imported must be taken to the Pacific coast,

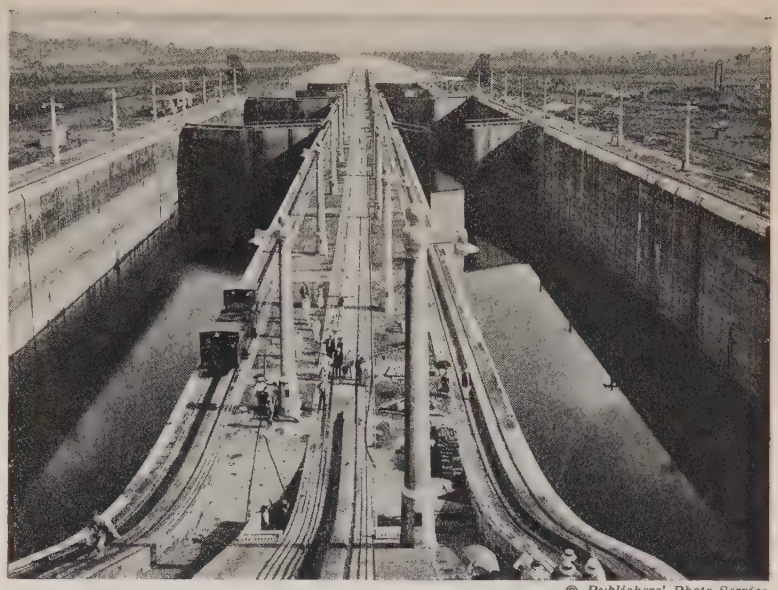
for in all these countries there are only three railroads that run from ocean to ocean, and wagon roads are few. Formerly such goods were usually shipped around Cape Horn.

The extent to which the canal is used is shown in the following table:

Vessels passing through the Panama Canal, whether east or west bound, in year ending June 30, 1925: 4,673.

Tons of cargo, 23,959,000.

Nationality of most of the vessels: American, 2,326; British, 1,211; Norwegian, 192; Japanese, 172; German, 163; French, 105; Dutch, 102; Peruvian, 73.



© *Publishers' Photo Service*

Fig. 228. — The Gatun locks of the Panama Canal

Locate these locks in Fig. 227. At this point vessels bound for the Pacific are elevated from the level of the Caribbean Sea to that of Gatun Lake, eighty-five feet higher. How many locks appear in the picture? While passing through these locks, vessels are moved by electric locomotives on the tracks beside them.

Prospect of progress in Central America. — When the number of inhabitants of the Central American countries is compared with their area (p. 190), it is seen that their population is sparse. For example, Nicaragua, which is larger than Pennsylvania, has only about one twelfth the population. With better education, better government, better roads, and other improvements, they could support many times their present number.

In increased population

Among the principal natural drawbacks are the facts that the surface is very mountainous and that the region is subject to eruptions of volcanoes and violent earthquakes. Nothing, of course, can be done to overcome these; but it is reasonable to expect improvements in education, government, and transportation.

The chief export at present is bananas; coffee ranks next. *Cacao*, consisting of the dried seeds of a tree grown in these countries, is also an important export, for from it chocolate and cocoa are made. Many foreigners have invested in plantations in these countries, on which bananas, coffee, sugar, cacao, rubber, and cotton are grown. Yet they have made only a beginning. The quantity of all these products could be very greatly increased; and, since there is a pressing need of each, the service of Central America in helping to feed the world will undoubtedly be multiplied many times.

In increased production

The success of our experiment in sanitation in the Canal Zone has proved that it is possible to make even these tropical lowlands healthful. This is an extremely important discovery for Central America. The example of stable government in their midst, as furnished by the United States in the Canal Zone, is also sure to have a steadying influence. Costa Rica has already shown much ability for self-govern-

In better government

ment, and largely for that reason has attracted much foreign capital. Nicaragua is beginning to appreciate the importance of education. The industries that the foreigners are helping to establish in all these countries, together with the ideas and habits that they are encouraging, are other helpful influences.

© Detroit Publishing Co.

Fig. 229. — Unloading bananas at New Orleans

Can you suggest how this apparatus works?

With all these examples before them, with the other advantages brought by the canal, and with their natural resources, the Central American states seem likely to make rapid progress.

Facts to be especially well fixed. — 1. The temperature regions and the distribution of rainfall. 2. The names and locations of the eight political divisions. 3. The main products. 4. Leading facts about the surface. 5. About the distribution of population. 6. Location and importance of the following: Panama Canal; Panama City; Colon; Gatun Lake; Gaillard Cut; Chagres River. See Fig. 227.

Problems for independent study. — 1. It is far more difficult to build and to keep up wagon roads in Central America than in the United States. Why? Carpenter, F. G.: *North America* (1922), p. 471 (American Book). 2. The climate of Central America is "so good to man that it spoils him." How can that be? 3. There has been some discussion of a through railroad from Buenos Aires to New York City. How might such a road benefit Central America? 4. Corrupt political leaders in Central America have opposed such a road. What reasons can you imagine for such opposition? 5. Some of the cities in Central America have been destroyed several times by earthquakes. Find examples. How must such a danger influence the construction of buildings? Herbertson, F. D. and A. J.: *Descriptive Geography*, Central and South America, pp. 38–39 (Black); Coe, F. E.: *Our American Neighbors*, p. 206. 6. How many of these countries are larger than Ohio? How do they compare with Ohio in population? 7. There was formerly much talk of locating the canal in Nicaragua. Locate the proposed Nicaragua route and find the arguments both for and against it. George, M. M.: *A Little Journey to Mexico and Central America*, pp. 51–53; Coe, F. E.: *Our American Neighbors*, p. 207.

VIII. Review of North America

1. Extent of our Natural Resources

Comparison of the United States with other countries of North America in area, population, and location. — In spite of its vast area our country, even including Alaska, is not the largest on the continent. What other country has a greater area, and how much greater is it? How does our country compare in size with Mexico? In population, however, the United States is by far

the largest. How many inhabitants has it? How many has Canada? Mexico? Central America? What is the population of the entire continent?

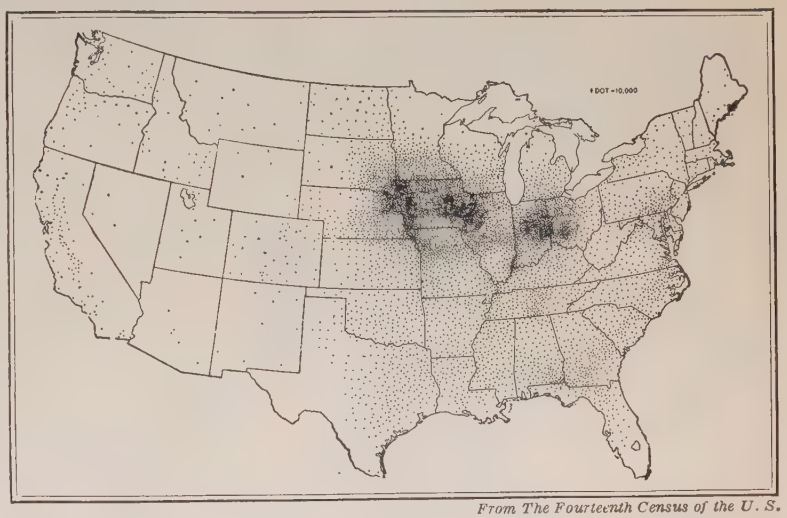
Why has the United States so far surpassed the others in population? What section of Canada is unsuited to agriculture on account of the cold (Fig. 12)? What sections of Mexico and Central America have been of little value because of the heat? Our climate, on the other hand, is temperate. What is the latitude of southern Florida? Of the northern boundary of Minnesota? Beyond question we occupy the most desirable part of the continent; and it is largely because the climate is so favorable to various industries that our population is so great. State the character of the summers and winters in different parts of the United States as indicated in Fig. 12.

The sources and quantities of our principal raw materials. — Where are our principal raw materials for food, clothing, and shelter produced? Are they ample to meet our needs even in the distant future?

Of our raw foods

Our greatest food crop is corn. Name the states in the Corn Belt (Fig. 70). In what other section of the continent is corn extensively raised (p. 96)? How do the four groups of states compare in corn production? How do you account for the differences? About how many bushels does the United States produce per year (p. 65)?

How many bushels of wheat do we produce (p. 65)? The United States and Canada are two of the very few countries in the world that raise more wheat than they consume. In Fig. 205 note the amount grown in Canada. What explanations can you give for the location of our principal wheat sections (p. 65)?



From The Fourteenth Census of the U. S.

Fig. 230. — Swine, 1920

In what sections of the country are hogs extensively raised (Fig. 230)? How do you account for their leadership (p. 71)?

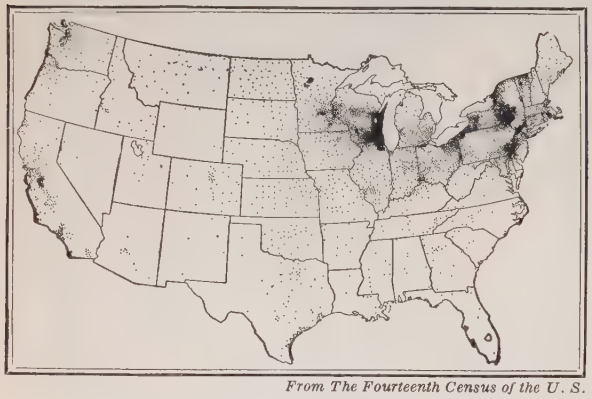
Cattle are far more widely distributed than hogs, as can be seen by comparing Fig. 73 with Fig. 230. Why should that be? What are the leading cattle-producing districts? Can you suggest reasons for their prominence? Fig. 231 shows the distribution of dairy products. Why do certain parts of our country surpass the others in this industry?

Fig. 166 shows where our sheep are raised. Why are there so many more in the West than in other sections (p. 146)?

What kinds of fruit are abundant in the Northeastern States (p. 56)? In the South (p. 97)? In the West (pp. 140 and 153)?

What fruits are especially common near the Great Lakes? Why do they thrive there? What fruits are grown chiefly in Florida and California (pp. 109 and 141)? From what region are most of our bananas obtained (pp. 202 and 207)?

From what two agricultural products is most of our sugar manufactured? Which state is most noted for sugar cane? What



From The Fourteenth Census of the U. S.

Fig. 231. — Value of Dairy Products, 1919
One dot = $250,000

advantages has it for that crop (p. 106)? What states grow the most sugar beets (p. 143)? How does the amount of cane sugar grown within the United States compare with that of beet sugar (p. 142)? Which of our outlying possessions produces large quantities of sugar (p. 174)? What other North American country produces vastly more sugar than the United States (p. 202)? What is the prospect for an increase of cane sugar in the South (p. 107)?

In which of our states is rice grown (pp. 108 and 140)? What peculiar advantages have our Southern States for the growth of rice (p. 107)? What prospect is there for a great increase in the amount raised?

Where are oysters most abundant (p. 57)? Salmon (pp. 157 and 169)? Where are cod principally caught? In what regions to the north of us is fishing the chief occupation (pp. 169 and 188)? Why?

Of our raw materials for clothing

What fixes the limits of the Cotton Belt? What other section of the United States has recently begun to raise cotton (p. 141)? The amount of cotton grown by us each year is about 11,000,000 bales, which is about one half of the world's supply.

Our leather and wool come mainly from cattle and sheep. From what states, therefore, must leather come? Wool? Where are both chiefly used in manufacturing (p. 45)? The other two chief materials used in making clothing are silk and linen; but we produce practically no raw material for either of these. We raise some flax, the plant from the fiber of which linen is made; but the fiber is not used by us, the flax being grown for the linseed oil that is manufactured from the seed.

Of our lumber supply

The principal forest areas of the United States are indicated in Fig. 14. Where are the hardwoods chiefly found? The soft woods? Make as full a list as you can of the trees of each kind. What facts can you recall about the extent of the lumbering industry in the South (p. 116)? In the West (p. 156)? What section of the country must be our main source of lumber in the near future (p. 156)? Upon what other country have we already begun to be partially dependent for our lumber supply (p. 92)? Locate the two chief forest areas in that country (pp. 176 and 181).

Of our metals

While gold and silver are called the precious metals, the metal that is most useful and therefore most important is iron. Give some idea of the extent of its use. There is one state that far surpasses all the others in its output of iron ore. Which one is it (p. 82)? In what other states is iron ore mined (Fig. 4)? What would be some of the consequences if the mines in Minnesota were to become exhausted? What regions would be seriously affected in manufacturing? What other North American countries contain deposits of iron ore that rival those in the United States? Locate their chief deposits more accurately (pp. 197 and 202).

The metal next in importance to iron is copper. Which states produce copper extensively (Fig. 153)? Which of these states seems to you most favorably located for shipping the copper to manufacturing districts? Why? What outlying territory of the United States produces copper (p. 170)?

In Fig. 153 locate the sections in which gold and silver are mined. What outlying territory of the United States produces gold (p. 169)? What other countries in North America produce silver (pp. 179 and 197)?

In which of our states are lead and zinc mined extensively (Fig. 153 and p. 82)?

Our sources and quantity of power for manufacturing. — Many raw materials are useless without power for manufacturing. How extensive is our supply of such power?

Our principal fuel is coal. One state alone produces about as much coal as all the others together. Which one is it? How much does it mine per year? How many tons of coal, per person, are mined in the United States each year?

Fig. 4 shows the distribution of the coal beds. What sections of the country are well provided with them? What sections are poorly provided?

Another valuable fuel is oil. In what sections is it found in large quantities (Fig. 30)? In what section is it extensively used for locomotives and in factories (p. 150)? What other kinds of engines make very extensive use of oil products for power?

A third important source of power is water in motion, often called *white coal*. Why is that a fitting name? How did the Ice Sheet affect our supply of water power (p. 10)? Which states have thus far most benefited from these effects (p. 34)? What rivers can you name whose falls produce a great amount of power for manufacturing? How does it happen that many irrigation plants in the West are also important as power plants (p. 138)? What important source of power do we share with a neighboring country (p. 34)?

Extent of manufacturing and location of leading kinds. — With raw materials and power so abundant, our opportunities for manufacturing are almost unlimited. How full a use are we making of these opportunities?

Our greatest manufacturing industry is the production of iron and steel and articles made from them. The greatest center of this industry is Pittsburgh, for reasons which you may recall (p. 42). Almost all the large cities in the Northeastern States are engaged in some forms of this industry; but they vary according to their peculiar advantages. For example, New England

produces very different goods from those of Pennsylvania and neighboring states. Explain what they are and account for the differences. The cities in northern and eastern Ohio closely resemble Pittsburgh in the nature of their iron and steel products. Why should they? Why are Chicago and Gary likewise noted as centers of iron and steel manufacture? What city in the South is most noted for the same industry (p. 120)? What peculiar advantages does it enjoy even over Pittsburgh? In what section of Canada is the iron and steel industry important (p. 177)?

In the North Central States, which excel the others in food products, four kinds of manufacturing are highly developed. One is the manufacture of flour. What flour centers can you name there (pp. 76 and 84)? Another is the preparation of meat. What cities rival one another for leadership in that occupation? Name several other cities that are also noted packing centers. A third important industry in the Middle West is the manufacture of farm implements. In what city is such manufacture most extensive? Why have Detroit and Indianapolis become leading cities for the manufacture of automobiles?

Two sections of our country now rival each other in the production of cotton goods. What are they? Fig. 134 shows the cotton mills both in the South and in New England. How do they compare in number? Yet there is for the most part a considerable difference in the kinds of cotton goods made in these two sections. What is it? What is the cause of this difference (p. 117)?

Woolen and leather goods are manufactured in many sections of the country, but New England surpasses all the others in these industries. What are its advantages and disadvantages for such work (p. 45)?

While we produce no raw silk, nevertheless we lead the world in silk manufacture. Paterson, in New Jersey, is our leading center for that industry. What kinds of manufacturing are prominent in the West (p. 149)? Which of the four groups of states leads in manufacturing?

Importance and extent of our transportation routes. — Since the different sections of our country are very dependent upon one another, there is an enormous demand for means of transportation. Without our highly developed transportation systems our whole plan of living would have to be modified.

Our waterways are very extensive, as indicated in Fig. 11, there being in all about 25,000 miles of navigable water routes. Name some of the more important. Which portion of the country is least supplied? There is one waterway that is far more important than any of the others (p. 73). Describe it and state the reasons for its special importance.

The railroads greatly surpass the waterways in the quantity of freight carried, as is suggested by the fact that the mileage is about 250,000. How does that compare with the mileage of water routes? The extent of their traffic and some of the principal goods that they carry are indicated in Fig. 232. The chief railroads over which traffic passes on its way from the Middle West to the Pacific coast are called *transcontinental* railroads. How many do you find on this map? Note that on the lower side of each line are named some of the things that are hauled westward, while above the line are some that go east.

Name some of the goods carried west on the different roads; some that are carried east. Can you explain in each case why such goods are carried? What goods are carried south? What goods go north? Fig. 233 shows the more important railroads. Which section is best provided with them? Which has the smallest mileage? Can you account for the difference?

The chief occupations of our population.—The seven great occupations are agriculture, lumbering, fishing, mining, manufacturing, transportation, and trade. Each of these employs many thousands of men in the United States.

The first four of these occupations furnish the raw material for food, clothing, and shelter; owing to the nature of these occupations, most of the people engaged in them live in the country or in the smaller towns.

Most of those employed in manufacturing, transportation, and trade live in cities in order to carry on their

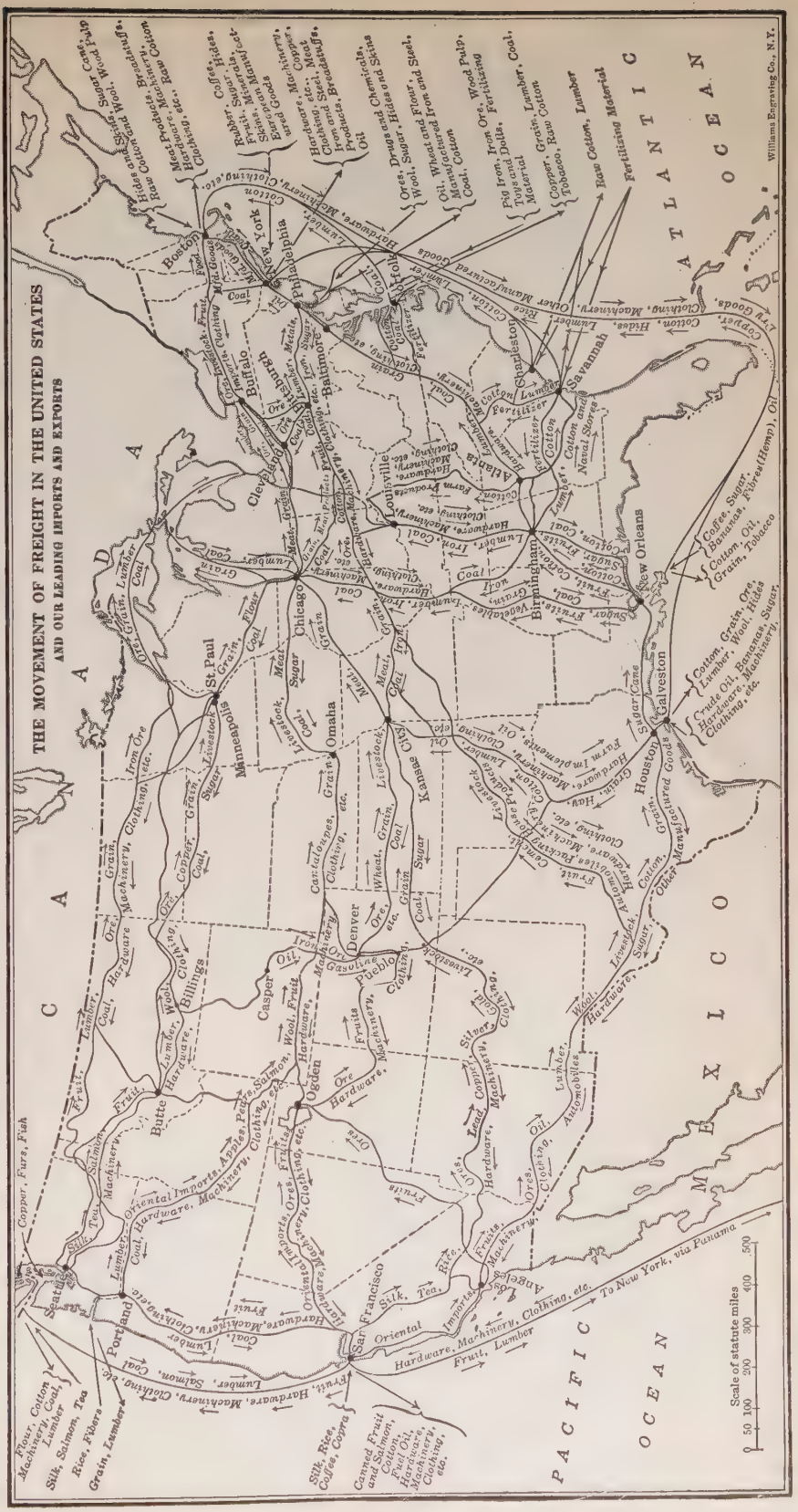


Fig. 232

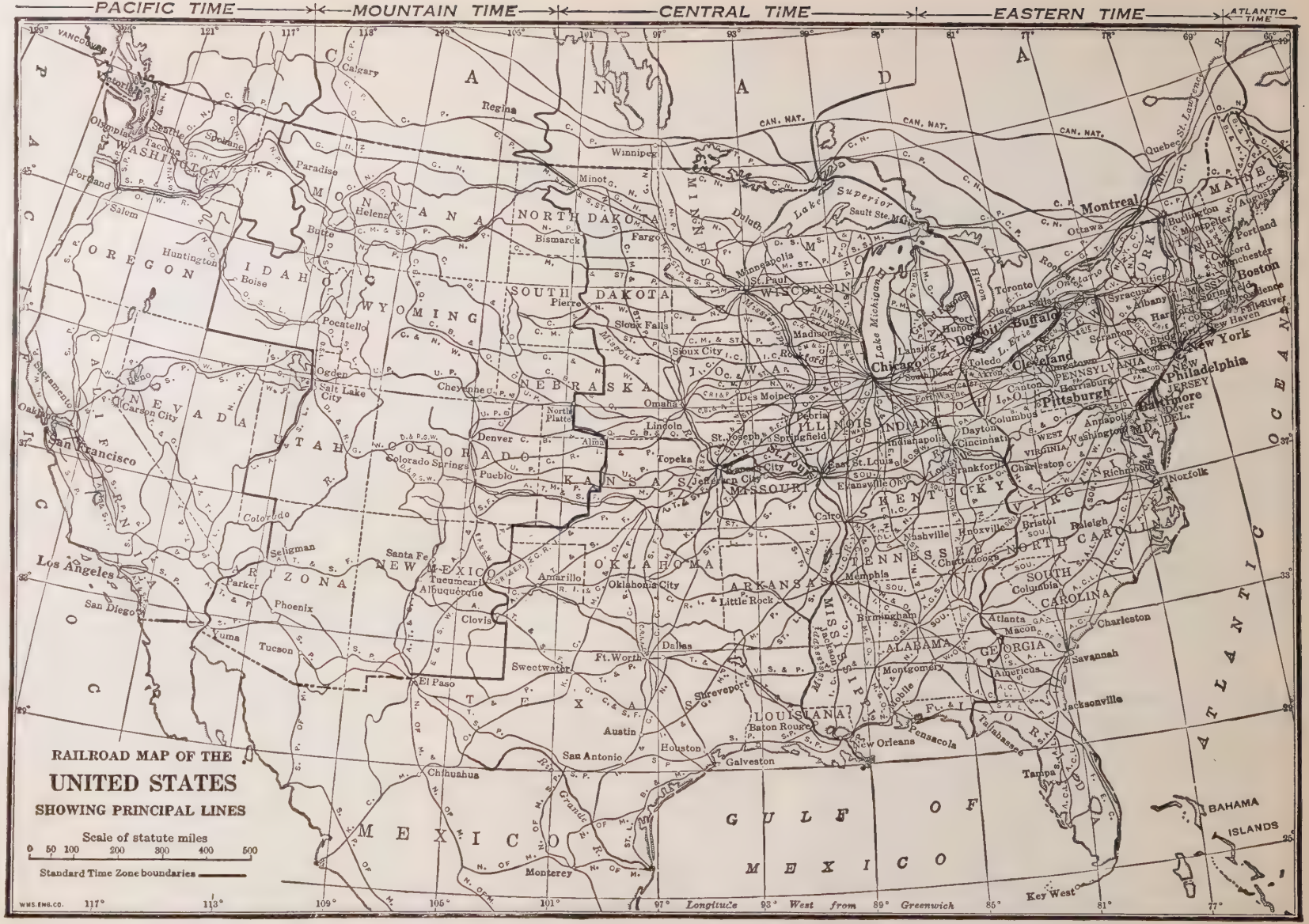

PACIFIC TIME
MOUNTAIN TIME
CENTRAL TIME
EASTERN TIME
ATLANTIC TIME
RAILROAD MAP OF THE
UNITED STATES
SHOWING PRINCIPAL LINES
Scale of statute miles
0 50 100 200 300 400 500
Standard Time Zone boundaries
Longitude West from Greenwich
CANADA
MEXICO
GULF OF MEXICO
PACIFIC OCEAN
ATLANTIC OCEAN
BAHAMA ISLANDS
WASHINGTON
OREGON
CALIFORNIA
IDAHO
NEVADA
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
MAINE
VERMONT
NEW HAMPSHIRE
MASS.
R.I.
CONN.
NEW JERSEY
DEL.
MD.
Vancouver
Victoria
Seattle
Tacoma
Olympia
Spokane
Portland
Salem
Eugene
Sacramento
San Francisco
Oakland
Los Angeles
San Diego
Fresno
Calgary
Regina
Winnipeg
Minot
Fargo
Bismarck
Helena
Butte
Huntington
Boise
Pocatello
Ogden
Salt Lake City
Carson City
Cheyenne
Denver
Colorado Springs
Pueblo
Omaha
Lincoln
North Platte
Des Moines
Sioux City
Sioux Falls
Pierre
Madison
Milwaukee
Minneapolis
St. Paul
Duluth
Chicago
Rockford
Peoria
Springfield
St. Joseph
Kansas City
Topeka
Jefferson City
St. Louis
East St. Louis
Evansville
Indianapolis
Dayton
Cincinnati
Columbus
Toledo
Detroit
Cleveland
Buffalo
Pittsburgh
Harrisburg
Philadelphia
New York
Baltimore
Washington
Richmond
Norfolk
Charleston
Frankfort
Louisville
Nashville
Knoxville
Chattanooga
Memphis
Cairo
Bristol
Raleigh
Columbia
Charleston
Atlanta
Macon
Savannah
Birmingham
Montgomery
Mobile
Pensacola
Jacksonville
Tallahassee
Tampa
Key West
New Orleans
Baton Rouge
Shreveport
Dallas
Fort Worth
Sweetwater
El Paso
Austin
San Antonio
Houston
Galveston
Amarillo
Oklahoma City
Little Rock
Albuquerque
Santa Fe
Tucumcari
Clovis
Seligman
Parker
Phoenix
Yuma
Tucson
Chihuahua
Monterey
Quebec
Montreal
Ottawa
Toronto
Hamilton
Niagara Falls
Syracuse
Albany
Rochester
Utica
Scranton
Boston
Portland
Worcester
Providence
Fall River
New Haven
Manchester
Concord
Burlington
Augusta
Bangor
Lake Superior
Lake Michigan
Lake Erie
Lake Ontario
Sault Ste. Marie
CAN. NAT.
C. P.
C. N.
G. N.
N. P.
S. P.
T. & P.
A. T. & S. F.
I. C.
C. & N. W.
C. M. & St. P.
C. B. & Q.
U. P.
D. & R. G.
M. K. & T.
K. C. S.
M. P.
St. L. & S. F.
L. & N.
N. C.
A. C. L.
S. A. L.
F. & I. M.
I. & G. N.
M. & O.
C. & E. I.
Longitude 117° 113° 109° 105° 101° 97° 93° 89° 85° 81° 77°

Fig. 233

work most successfully. Thus 48.1 per cent of our population live in the country and 51.9 per cent in the cities or towns containing 2,500 or more persons. Name from memory the ten largest cities in order of size and compare the list with that in the Appendix to see how nearly correct it is. Show by several examples how very dependent city and country people are upon each other.

The more advanced nations of the earth have usually passed through two stages of growth, or of civilization, and are now in the third stage. In newly settled lands men have depended mainly upon hunting and fishing for food and clothing. We call them pioneers, and the stage of civilization which they represent, the *pioneer stage*. Gradually, as new settlers have arrived, agriculture has been taken up, and the *agricultural stage* has been reached when this has become the chief industry. The third or *manufacturing stage* arrives when manufacturing has been so extensively developed that it forms the chief occupation of the population. Our country is now in this stage.

How much farther our manufacturing will develop remains to be seen. We still produce more from the soil than we consume, but not such an excess as formerly. As our population grows and the number engaged in manufacturing increases, we may find ourselves dependent upon other parts of the world for a large part of our food, just as some of the nations of Europe now are.

2. The Conservation of our Resources

Our obligation not to waste our resources.—The consumption of our resources has, in general, increased at an astonishing rate during the last twenty years. The following table shows the extent of our production of a few raw materials in some years of this period. Observe that, with the single exception of lumber, these figures have increased with alarming rapidity. How do you account for the decrease in lumber production?

The increasing demands made on our resources

	1900	1910	1920
Wheat	602,708,000 bu.	635,121,000 bu.	833,027,000 bu.
Lumber	34,780,513,000 bd. ft.	40,018,000,000 bd. ft.	33,799,000,000 bd. ft.
Coal	211,810,000 T.	501,595,960 T.	658,264,760 T.
Iron ore	30,859,000 T.	63,716,800 T.	77,594,720 T.
Copper	303,058 T.	540,080 T.	604,530 T.
Petroleum	63,621,000 bbl.	209,557,000 bbl.	442,929,000 bbl.

Thus we are making enormous demands on our soil, our forests, and our mines. No country has ever before consumed its natural resources at such a rate. We average nearly five acres of improved land to each one of our inhabitants, while some foreign countries average less than one acre. On that account we are able to supply ourselves far more liberally with food than many other countries. And our supply of other materials is correspondingly greater than theirs.

But what about the distant future? We are one of the very young nations of the earth and our population is only a small part of what it may become. In 1890 our inhabitants numbered only 62,948,000; in 1900 they were 75,995,000; in 1910 they were 91,972,000; and in 1920 they were 105,711,000. At this rate we shall have at least 150,000,000 by 1950 and a century after that possibly several hundred million. Will there then be ample resources for so many people?

Why we are under obligations to be saving

There was a time when our resources seemed to have no bounds. The immigrants coming here from the small countries of Europe were greatly impressed with the bigness of our territory. Its forests seemed limitless

and its farm lands equally vast. Some forty or fifty years ago the children in our schools were singing, "Uncle Sam is rich enough to give us all a farm." Many have had a similar feeling about our supply of coal and of minerals.

Yet none of these treasures is by any means inexhaustible. Should their consumption continue at the ever increasing rate of the last twenty years, it will be only a few decades at the most before some of them will be exhausted. Thoughtful people have for a long time been pointing out this danger, but not until about the year 1908 did interest in the subject begin to be general. In that year a large number of public men met for a conference on the matter, and a National Conservation Commission was appointed to make an inventory of our resources. Since then many people have come to realize that our resources are very definitely limited and that they must be protected from exhaustion with the greatest possible care.

The soil, forests, coal, ores, and oil are valuable properties that we have a right to use; but we have no excuse for extravagance or wastefulness in their use. They belong in part to future generations and must be conserved in part for them, being held by us in trust. How long a time it took to form our coal you can, no doubt, recall (p. 5). Our other minerals have likewise required thousands of years to be collected in beds and veins; and the production of soil is also the result of ages of change. Even our forests represent generations of growth, and some of those that we most prize are hundreds of years old; indeed, a few of the Big Trees of California have been growing since before the time of Christ. If, therefore, these treasures are extravagantly used by us and exhausted there is no way of making good the loss. In that case future generations will be deprived of their rightful inheritance because we have been grossly selfish and untrue to a trust.

How we have been meeting this obligation. — How have we been meeting this obligation? First, how have we been meeting it in regard to the soil?

We have been very careless in two ways. In the first place we have neglected to maintain the fertility of the land. In some of the Southern States phosphates have been extensively used. Recall the states that produce large amounts of it (p. 112). In many localities barn manures and other fertilizers have been spread upon the fields in large amounts. But a great many farmers have developed bad habits, owing partly to the supposed abundance of land. They have grown crops year after year without using fertilizers until the soil has become too sterile to produce good crops; then they have moved away to new lands farther west. A good many farms in the East have been abandoned partly on this account. Many other farmers have not fully understood that fields can be starved as truly as animals can be, and have gone on raising smaller and smaller crops each year, until they can scarcely make a living. Often the methods of agriculture have contributed directly to the exhaustion of the soil, for many farms in the South, for example (p. 111), have raised one crop for long periods of years until the soil has become very much exhausted. In every part of our country there are now great numbers of fields that are suffering from lack of fertilization.

Our carelessness in regard to the soil

1. Our failure to fertilize it

The other mistake is even worse, for it has led to the complete destruction and

loss of quantities of soil. It is the work of running water to carry away anything loose that it can find, and loose soil is its chief burden. How it does its work you can see on any roadside or hillside. If grass or forest or other vegetable growth covers the ground, the decaying matter, consisting of leaves and rotting wood, acts as a sponge to absorb much of the water, or at least delays its flow over the surface, and the roots, gripping the soil firmly, hold it in its place. Where, however, there is little or no vegetation, the running water is fearfully destructive. The newspapers often tell of disastrous washouts along the railroads in the arid regions of the West; and, no doubt, many readers wonder how there can be such destructive floods where there is so little rain. The explanation is simple enough. While the storms there are few, the rainfall at any one time may be so heavy that the water collects rapidly, and there is little vegetation to check its flow. Consequently, small rivers soon form that tear off and carry away the soil, wash out stretches of railroad, and cut up the ground so badly into furrows and gullies that it is almost impassable. Such lands are often named *bad lands* partly because the rains have made them useless; they are found in many arid districts in the West.

2. Our failure to protect it from damage by water

In many parts of our country men have directly aided this action of the water by their treatment of the land. They have cut away forests on the steep mountain slopes and hillsides, and then in many cases have plowed the land for crops. The crops that they have raised, too, like cotton and corn, have required that the fields be kept as "clean" as possible during the growing season, and year after year have left the soil bare and exposed during the winter. In such places there is nothing to check the collection and flow of water. In consequence the spring floods are higher than they used to be; the rushing waters have washed away much of the soil from many of the steeper slopes, and have so cut up many of the more level sections by gullies or so covered them up with sand and gravel brought down from higher levels that hundreds of acres of land are nearly useless. See if you can find any

Fig. 234. — A productive field destroyed by erosion, Tennessee

Through careless tillage the water after heavy rains began to cut small gullies in this field. Nothing was done to check erosion, and this is the result.

such ruined land in your neighborhood (Fig. 234). Millions of tons of the finest soil — which is the most valuable of our resources — are thus carried away every year by running water and completely lost.

Have we protected our forests? While wood is not so valuable as soil, we could hardly do without it. The Eskimos value it almost as we do the precious metals, and if we were deprived of it as they are we should soon come to regard it as they do.

Our carelessness in regard to the forests

One difficulty here, again, is that the early settlers fell into bad habits in their treatment of the forests; and these habits have con-

tinued more or less down to the present time. Wanting to till the soil and believing that the best farm lands were those that produced the broad leaved trees, they cleared away the timber from these lands. That was so big a task that they came to regard the oaks and hickories and beeches and walnuts as worse than a nuisance; they regarded them as real enemies that ought to be destroyed as quickly and completely as possible. The amount of lumber that they needed for building and other purposes was so small, compared with the quantity of timber about them, that there was no influence to check such ruthlessness. So they cut down magnificent trees, dragged the logs into piles, and burned them. Even destructive forest fires, provided only trees were burned, were often welcome.

Many persons have only partially recovered from this inherited feeling toward trees. Others who have not cherished it have nevertheless imagined that our forests were practically inexhaustible. On that account they have cut away trees freely and have made any use of them that they wished. For example, in order to obtain naval stores (p. 116), they have tapped the hard pines over vast areas in the South in ways that have usually killed them within five years, although other methods could have been followed which would have allowed a much longer life.

Meanwhile our just demands for lumber have been increasing at an astonishing rate. In consequence of all these influences working together, we are now using from seven to ten times as much wood per person as the wealthiest nations of Europe; and our timber is being consumed at least three times as fast as it is being produced.

Next to soil, fuel is probably our most important resource. How careful have we been in its conservation? We have acted as if the supply were unlimited. In the mines themselves it has been customary to leave about one quarter of the coal as a support for the roofs of the underground chambers, although at a little more expense substitute supports might have been provided, so that all the coal could have been mined. A few years ago it was estimated that in some mines two tons of coal were wasted to every ton put upon the market, being broken up into fine coal and thrown away. An enormous amount of coal is consumed in the production of coke; and the beehive oven that has been much used for the purpose is noted for its waste of fuel. Again, in firing furnaces and coal stoves, few persons know how to lay on the coal and regulate the draft so as to obtain the greatest possible heat from a given amount. The quantity of coal that can be seen in the average ash can waiting to be carried to the dump heap shows perhaps as clearly as anything how little we have thought about waste. While in spite of all our carelessness we have consumed less than one per cent of our available coal in the ground, our rapidly increasing demand for such fuel gives reason for fears about the future.

Our carelessness in the consumption of mineral products

1. In the consumption of coal

Have we taken any greater precautions in our use of oil and gas? It has been estimated that the quantity of gas that has been escaping during many years from our oil wells has been equal in value to hundreds of thousands of tons of coal every day. This gas has been of no use to us whatever. But our carelessness in regard to what we have used is nearly

2. In the consumption of oil and gas

as striking. For instance, in towns and cities where natural gas is provided, many of the street lights have been allowed to burn night and day. The wasted gas was considered of less value than the labor of turning it off. As might be expected, the supply in many places is already exhausted and in others it is not likely to last many more years.

Less of our oil has been wasted in securing it from the earth; but the difficulty here is the extravagance of our demands. Every American wants to own an automobile; and because the demand is greater than the supply, the price of oil is rapidly advancing, as in the case of lumber. The immense amount of gasoline that is burned purely for the pleasure of driving can easily be imagined when one sees the endless procession of pleasure cars passing along any important highway between a large city and the country.

The metals, being more difficult to obtain, have not been so much wasted. Yet we are mining them very rapidly; and our treatment of the other resources already mentioned is sufficient indication that we have not seriously considered whether or not we are leaving a fair supply of these minerals to future generations. Iron, copper, lead, zinc, and the precious metals can be melted and thus used over and over for different purposes. If we continue to consume them so lavishly we should at least settle upon carefully considered plans for conserving them.

3. In the consumption of metals

The reputation of our people for wastefulness. — Our people have been very energetic in devising and quick in supporting measures that promised to save life and property. For example, while cottonseed was formerly thrown away or used as fuel, it is now utilized for the production of several highly valuable foods. Recall some of them (p. 117). Our study of the winds and storms now enables us to predict the weather so as to protect life and property on land and sea. See if you can name a dozen other inventions or improvements that have likewise resulted in extensive saving. The number is large.

Our attempts to avoid waste

In spite of such advances, we have come to be regarded by many foreigners as both careless and extravagant to an unusual degree. In reaching this conclusion our critics have many other facts in mind as well as those concerning our use of natural resources. For example, we have almost exterminated the buffalo. The fur seal has barely escaped extermination. The whale, which also was once abundant in our surrounding waters, has become rare (p. 172). The existence of other wild animals, including important species of fish, has been seriously threatened.

Examples of our wastefulness

Figs. 73 and 166 show that a vast number of cattle and sheep are raised in our Western States, yet there is fearful loss of life among those animals, involving untold suffering. In a recent hard winter, according to government reports, 1,175,000 cattle and 900,000 sheep perished there from "exposure," which means from cold and starvation. Estimating each head of cattle at 500 pounds and each sheep at 60 pounds — which is moderate — you can calculate the loss in meat. What an enormous waste! Yet men who have studied the matter say that reasonable precautions would have prevented most of this loss.

No one class of our citizens seems more to blame than another in the tendency toward waste. It is very common for children

gathering flowers to pick all that they can find, in spite of the fact that the flowers are the seed-producing part of the plant from which future plants must grow. In addition, as if to destroy plant life completely, people burn over their ground in late fall or early spring, thereby killing great numbers of young plants and seeds, besides seriously damaging the thick layer of decaying vegetation, called *humus*, from which these obtain part of their nourishment.

How we can make use of our resources with least possible waste. — How can we prevent waste, particularly in the use of the soil? The coal, iron ore, copper, and other metals must some day become exhausted, no matter how carefully they are exploited. But fortunately the soil, if carefully treated, will last forever. Fields in China, Japan, and India that have been cultivated for forty centuries are still as productive as ever.

How we can get most from the soil without injury to it

1. Ways of increasing the quantity of land under cultivation

First of all, we should cultivate as much of the land as possible. The irrigation of arid areas in the West is a step in the right direction. What can you recall about the extent of irrigation there (Fig. 135)? Dry farming in the West has, also, greatly added to our food products. What do you remember about it (p. 144)? In the South only a comparatively small part of the land suitable for cultivation is now being farmed. In what states is new land available (p. 111)? Swamps that have been well drained make some of the very best farms; and out of the 80,000,000 acres of swamp in the United States there are probably 40,000,000 that can be made productive by draining. How many 160-acre farms would that allow? For one reason or another only a small part of the land is under cultivation. In almost every locality there are vacant plots that could just as well bear crops. Are there any such in your neighborhood?

2. Methods of fertilizing the soil

In the second place, the soil should be kept fertile. The chief kinds of plant foods, or chief elements, that crops take from the soil are *phosphorus*, *nitrogen*, and *potassium*. Unless these are put back into it at least as fast as they are removed, the land is robbed. It may be several years before the effects of such robbery are observed in the smaller crops produced; but they are sure to come.

The harm caused by one-crop farming is plain, when one realizes that it subtracts the same elements from the soil year after year. How is this being remedied in the South at present (p. 111)? The soils in different sections vary greatly in quality, some needing one thing and others another to enrich them. Only scientific experts, who make a business of studying the soil, can tell what is wanted in any particular field, and in order to secure the best results they should be consulted.

3. Methods of preventing soil waste

How can the erosion of soil be prevented? There are several ways. In thickly populated countries where the surface is rough, the slopes are terraced extensively. Such terracing is shown in Fig. 449. Explain the plan as you see it there. What can you say about its cost? Are there any slopes in your vicinity that are terraced or that might well be? We have so much land per person that it has not yet been necessary to terrace much land.

Farm land that has gentle slopes should be plowed so that the furrows keep on a level instead of running downhill. Otherwise, the water may form a stream in each furrow that will wash the soil away rapidly. Such plowing is called *contour plowing*. See if this

precaution is practiced in the plowing of slopes in your neighborhood.

Probably the most important means of preserving the soil is not to attempt to cultivate the slopes, but to keep some sort of vegetation upon them; it may be forest, or grass, or orchard. In this way the fields below the slopes are protected as well as the slopes themselves. Explain how.

Conservation of the soil, as we have seen, is tied up with the conservation of the forests. How can the latter be conserved? One thing to do is to find more economical ways of cutting timber and of using wood. Trees are often cut too far above the ground, and when they fall they are allowed to destroy the smaller trees about them (p. 156). It also frequently happens that little more than one third of a tree that is cut for timber is used. In some European countries scarcely any part of a tree goes to waste. The stump is as low as possible and all parts of the log are utilized; even the sawdust is saved for the manufacture of alcohol, and the branches that are too small for other purposes are carried away for firewood. With us, however, all but the very choice part of the log is likely to be thrown away. If we saved all the waste in the logging and milling of our pines, including the stumps, we could manufacture from it a large part of the turpentine that we need; and if we were similarly saving in the logging and milling of spruce and certain other trees, we could manufacture from such waste a good portion of our paper. Charcoal and wood alcohol can be made from the waste of hard woods.

How a fair supply of timber can be assured for the future

1. Ways of economizing in the cutting and use of timber

Economy should be applied to the use of lumber also. Boards, boxes, barrels, and other wooden articles that have been used once could often be used again instead of being thrown away or burnt. The life of shingles can be greatly lengthened by dipping them in creosote before putting them on the roof; and paint accomplishes the same purpose with all kinds of wood. Substitutes for wood also are available, such, for example, as brick, tile, cement, stone, and metal; and it is often economical to employ them. Such measures of economy have always been practiced to some extent; but they should become far more common. The advancing price of lumber will no doubt greatly aid in establishing them.

At the same time better protection of the forests is necessary. The measures to be taken for that purpose are best illustrated by the work of the *forest rangers* who are employed by our government. Timber has been so rapidly disappearing that it has seemed wise for the government to come to its protection. Accordingly it has taken over the forest areas shown in Fig. 235. Locate the larger areas in the West. What sections in the East and South are also under government control?

2. Methods of protecting the forests

The forest rangers look after the leasing of the forest land for grazing purposes. Another duty is to prevent and check fires. The average annual loss of timber by fires is estimated at $50,000,000, and some years it is more than $100,000,000; so that the importance of the task is evident. As many as a dozen forest fires have been known to be started by lightning in the course of a single thunder storm; many others are caused by careless campers and smokers, by sparks from locomotives, and in other ways.

In the summer, when the forests often become very dry, it is the chief duty of the

forest rangers to patrol them on the lookout for fires. Men stationed at high points are continually on the watch for columns of smoke, indicating the beginning of a fire; and when such a discovery is made a signal is given calling out the nearest force of fire-fighting men.

The rangers also supervise the sale and cutting of timber, allowing only the mature trees and those showing serious defects to be removed, and seeing that in such removal the young trees are not injured.

They replant areas that have been burned or cut, thus making thousands of acres useful that might otherwise remain idle. There is a very large amount of land available for timber, whose soil is too thin for any other purpose.

The rangers also fight the insect enemies of trees, of which there are many, sometimes cutting down and burning great numbers of trees that have become infected. The damage to vegetation wrought by insects is enormous, as is proved by the ravages of the boll weevil in the Cotton Belt (p. 105) and by the plant lice, chinch bugs, and other vermin in gardens and on farms. The study of their habits with reference to methods of destroying them has therefore become a very important science.

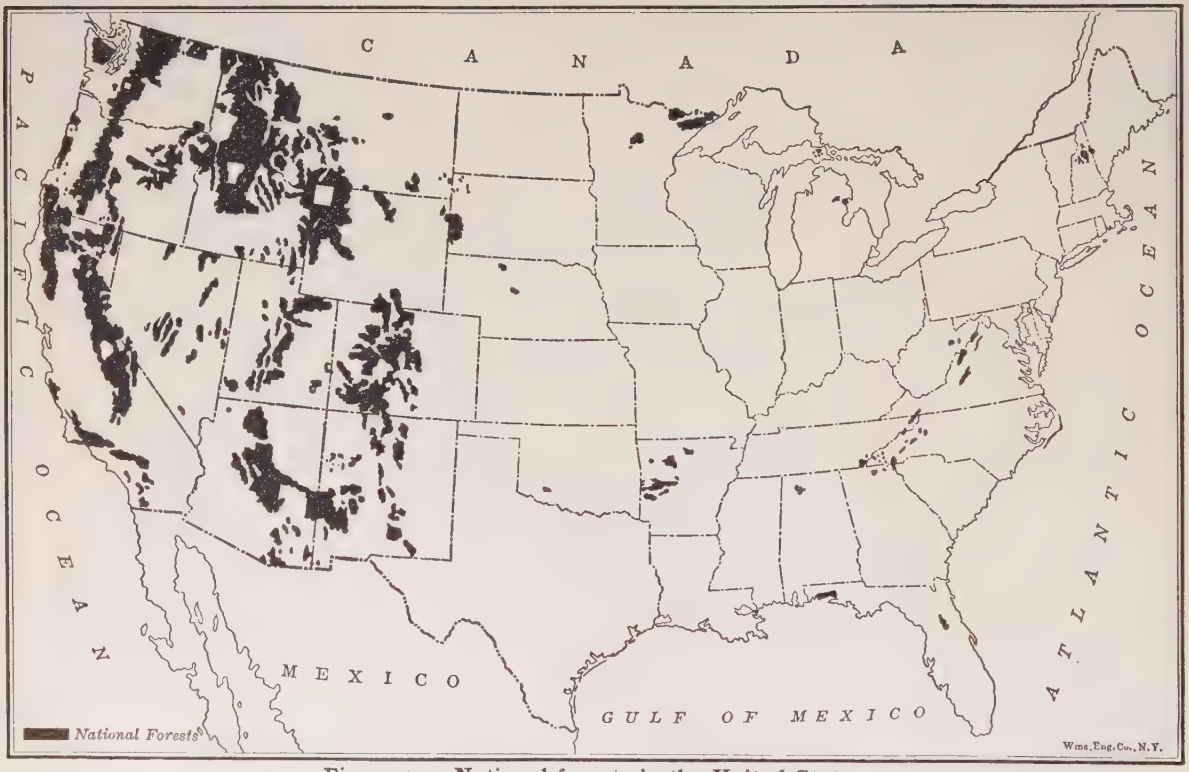


Fig. 235. — National forests in the United States

Such care of trees on the part of the government suggests some of the measures that might be followed in privately owned forests. In some parts of Europe a man is not free to cut down trees even upon his own ground, for the public is recognized as having some right in them. Many of our steeper slopes and lands that have thin soil should be reforested. A large number of our communities are already alive to these questions

and are taking steps to protect their trees. What measures, if any, do you think might well be taken in your community?

How shall we conserve our minerals? There are only two important ways in which the metals can be conserved. One is by painting those that rust easily. One often sees iron bridges and fences, water pipes on houses, mosquito screens, and other metal objects decaying rapidly because of exposure. Metal paint accomplishes the same purpose here that ordinary paint accomplishes in the case of wood. The other way is to make use of all scraps. Since iron, copper, and other metals can be used over and over, all discarded pieces, as, for example, old stoves, iron pipe, etc., should be melted up for further use. A very large amount of metal can be saved in this manner.

How our minerals may be better conserved

1. Methods of conserving our metals

Coal can be conserved at all stages of its production and use. The unnecessary waste in the mines has been mentioned, as well as that in firing. The loss with the ashes can be prevented by sifting. Much coal of poor quality can be made valuable if properly prepared. In Europe great quantities of dust-like coal are pressed into the form of small bricks, called *briquettes*, which are the only kind of fuel found in many places. These are now becoming increasingly common in the United States.

2. Methods of conserving our coal

There are still larger ways, however, of saving coal. One is to make fuller use of our water routes. We have an enormous mileage of navigable waters. Our railroads are often overtaxed to haul all the freight demanded of them. Yet the waterways are nearly idle, with one exception. Name it. And this is true even though the consumption of coal by water transportation is very much less than that by rail.

There is another even greater possible means of conserving coal — by the use of "white coal." The electric power obtained from Niagara Falls runs the street cars and factories in Buffalo and surrounding places, doing daily the work of many thousand tons of coal (p. 34). One power plant on the Mississippi River is doing a similar work for towns in its vicinity. Recall its name and location (p. 73). The Chicago, Milwaukee, and St. Paul Railway system has electrified about 660 miles of its line in Montana and Washington. The water power used by this one railroad saves daily over 800 tons of coal.

There are many sections of the United States in which water power is abundant. All together there are from 40,000,000 to 60,000,000 horse power available in our rivers; and by the storage of flood waters in reservoirs this amount might be doubled. As one writer expresses it: "We have enough water power to operate every mill, drive every spindle, propel every train, and light every city, town, and village in the country." Think how much coal might in that way be saved! Yet only about 10,000,000 horse power is now being used. What per cent is that of the total supply? Water power can be conserved only by being used, and in that respect is unlike all our other resources. So long as it is unused it is wasted. What a lamentable waste, therefore, we are allowing!

The responsibility of each person for conservation. — Responsibility for conservation is something that does not fall upon the government alone, nor upon a few prominent persons. Every time any one wastes food or clothing, or allows boards to decay owing

to neglect, or consumes gasoline unnecessarily, or throws away scrap iron, he is making an inexcusable demand upon the soil, or the forest, or the mineral resources, raising present prices, and ignoring his obligations to future generations. Thus every one of us bears responsibility for practicing conservation. What opportunities do you see for it about you?

There is responsibility for conservation also in a broader way. The shade trees and birds should be more carefully protected in every community; fires should become less frequent, and injury to property less common. In order to bring about these and other similar improvements much thinking and argument are necessary; laws must be passed and enforced and people must be shown the evils of waste. Should boys and girls as well as men and women have a share in such progress?

Problems for independent study. — 1. Write a composition showing the importance of the work of the forest rangers. Include their influence upon the lumber supply, upon soil, and upon navigable rivers and harbors. Outlook, vol. 81, pp. 489–495; World Book, under *Forestry in the United States*. See same title in New International Encyclopedia; Chamberlain, J. F., and Chamberlain, A. H.: *North America*, Chapters XIII–XIV (Macmillan). 2. Compare the present prices of lumber with those of twenty-five years ago. 3. Find out how different kinds of coke ovens are made and operated. 4. Why were people urged to "eat more fish" during the World War? 5. Collect poems on the value of trees. 6. Find out how coal can be most economically used in stoves and furnaces. Write to U. S. Bureau of Mines, Washington, D. C., for the Bulletin it publishes on this subject. 7. Read the small book on *Conservation* written by H. W. Fairbanks and published by the World Book Company. 8. Make a list of examples that you have observed of waste of resources. National Geographic Magazine, 1915, vol. 28, pp. 589–603; Encyclopædia Britannica, vol. XXIII, p. 710.

PART II. GENERAL GEOGRAPHY

I. The Earth

Form and size of the earth. — The earth is a sphere with a circumference of approximately 25,000 miles and a diameter of about 8,000 miles. It is slightly flattened at the poles, however. For this reason, the line which extends through the center of the earth from pole to pole — called the earth's *axis* — is a little shorter than the diameter at the equator.

Proofs that it is round. — The earth is known to be round or spherical in shape, not only because people have traveled around it, but also because its shadow on the moon, as seen in an eclipse, is always round. A sphere is the only body that will always cast a round shadow. Can you give other proofs that the earth has the form of a sphere?

Its daily motion, and the results. — The earth is steadily turning, or rotating, about its axis. This motion has very important results. In the first place, it causes sunrise and sunset, and thus day and night. When we glance out of the window of a moving train, the objects that we pass appear to be moving in the direction opposite to that in which we are traveling, while we seem to be standing still. In a similar way the rotation of the earth causes the sun to appear to rise and set. Indeed, for a long time people believed that it was the sun that moved, and not the earth. Since we first see the sun in the east, it is plain that the earth is rotating from west to east. And since one complete rotation requires twenty-four hours, it gives us a day of that length.

By rotating a globe or any spherical body in the sunlight, show how day and night are caused on the earth. Hold the sphere still; what would be true about daylight and darkness on the earth if it did not rotate at all? What might be the effect upon life on the earth if the same side were always turned toward the sun?

The yearly motion of the earth. — The earth has another motion that is of very great importance. This is its *revolution* around the sun, which is illustrated in Fig. 236. The object shown in the center of the circle is the sun, as you see, and the circle itself shows the course that the earth takes in its revolution. This nearly circular path is called the earth's orbit. Thus you see that the earth is forever swinging around the sun, although that body is 93,000,000 miles from it. It takes a year to complete one revolution, as the dates in Fig. 236 show. Indeed, the time necessary for this great journey is what fixes the length of our year.

Effects of the earth's revolution. — The revolution of the earth and the constantly changing position of its axis with reference to the sun, as shown by Fig. 236, cause our seasons and the changing length of our day and night.

In Fig. 236 the lowest sphere, bearing the

date September 23, represents the earth as receiving the light of the sun from pole to pole. On that date day and night are equal everywhere upon the earth. It marks the end of summer and the beginning of autumn in the northern hemisphere.

Following the earth in its revolution (to the right), we find that, as the months pass, the north pole falls farther and farther into the shadow, until the farthest point is reached about December 21. That is the date for our shortest day and longest night. Farther north the nights are longer still,[1] and the Eskimos who live far within the Arctic circle are having a night that lasts week after week. It is upon this date, also, that our winter begins.

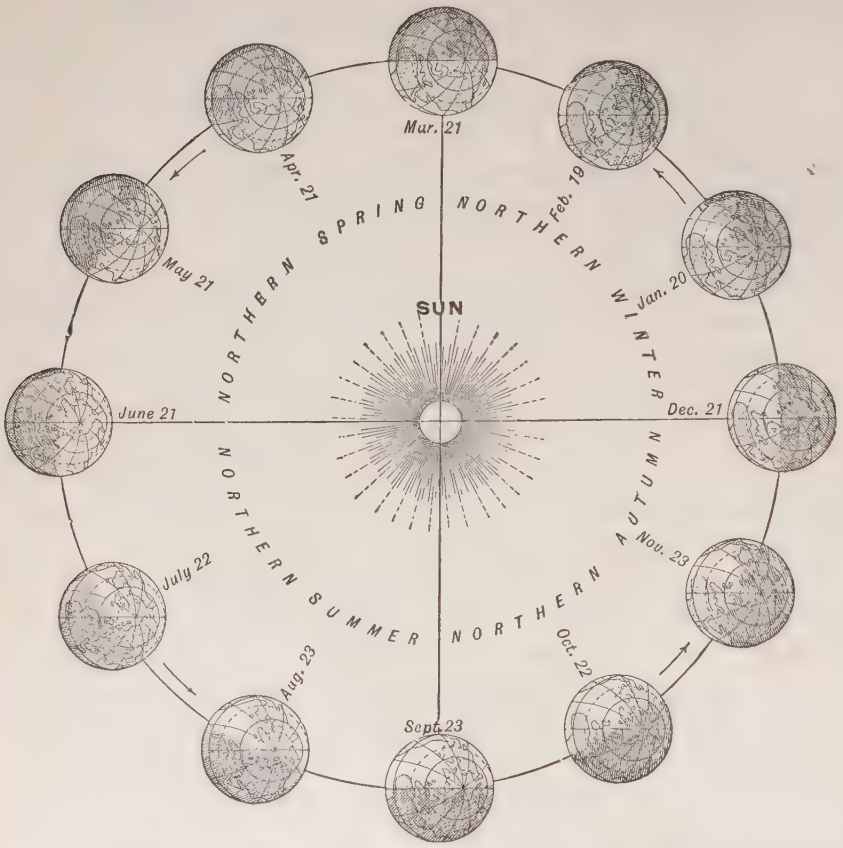


Fig. 236. — A diagram to illustrate various positions of the earth in its revolution around the sun

In a diagram like this it is impossible to show everything in its true proportion. With the earth represented as large as it is in this diagram, the sun should be five feet in diameter and the earth's orbit should be nearly 1,100 feet across. The shaded portions of the earth represent night. The north pole is the point on the earth's surface where the lines come together. The exact date when the earth reaches each point in its orbit varies slightly from year to year.

Show from Fig. 236 how this change is reversed during the other half of the year.

While these changes are in progress in the northern hemisphere, there are also changes in the seasons and in the length of day and night in the southern hemisphere. These changes are of the same kind, but the seasons are exactly changed about; that is, it is winter there when it is summer with us; and when the north pole is in darkness, the south pole is bathed in sunlight.

The zones. — Fig. 237 shows the so-called *zones* on the earth. How many are there? Name and locate each. The cause of the zones is found in the slant at which the rays of the sun strike

Cause of the zones

[1] Exactly at the pole the sun is above the horizon for six months and then below it for six months; there is continuous twilight for several weeks before it rises and after it sets.

the earth. In the torrid zone they are always either vertical, or nearly so. In the temperate zone, they strike the earth at a greater slant; and in the frigid zones at a greater slant still. On this account, the heat grows less and less as one approaches either of the poles.

The boundaries of the *tropical* (*torrid*) *zone* are easily fixed, because they mark the points farthest north and south where the sun's rays are vertical at some period of the year. On December 21, when the north pole is farthest within the shadow

Their boundaries

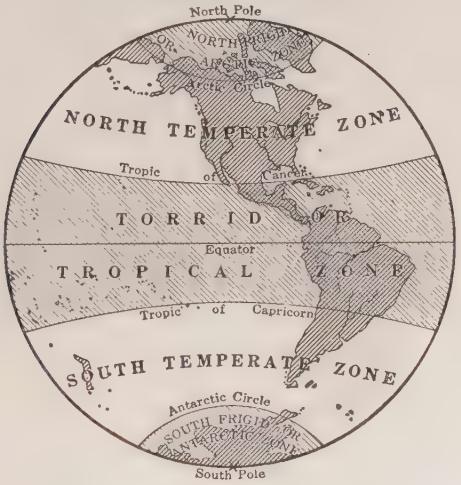


Fig. 237

(Fig. 236), the sun's rays are vertical at the Tropic of Capricorn. On June 21, on the other hand, when the north pole is farthest within the light, the sun's rays are vertical at the Tropic of Cancer.

The *north frigid* (*Arctic*) *zone* is the region around the north pole that lies entirely in darkness on December 21. The *Arctic circle* forms its southern boundary. On June 21, this same region lies entirely in the light. The *south frigid* (*Antarctic*) *zone* is the corresponding region about the south pole. Name its northern boundary.

The two *temperate zones* are merely the wide belts that lie between the torrid zone, on the one hand, and the frigid zones on the other.

The *zones* thus bounded are determined solely by our relation to the sun. On the other hand, the boundaries of the *temperature* or *heat belts* are quite irregular. See, for example, Fig. 12. See also p. 240.

How the earth's revolution causes our seasons. — Our seasons are likewise due to the slant at which the sun's rays strike the earth at different times of the year. On December 21, the midday sun is low in the sky in the region where we live, and then its rays reach us at the greatest slant. That marks the beginning of our coldest season (Fig. 236). On June 21, on the other hand, the midday sun is high in the heavens, and the rays are then most nearly vertical. That marks the beginning of our warmest season. Spring comes as the rays become more nearly vertical; and autumn as they grow less so.

Facts to be especially well fixed. — 1. The cause of day and night. 2. The explanation of the seasons. 3. The names and boundaries of the zones.

Problems for independent study. — 1. Show by a globe, or a ball, how the two movements of the earth, rotation and revolution, can be going on at the same time. 2. Are the days growing longer or shorter at present? 3. During which months do they grow longer? During which months, shorter? 4. At what time of day does your shadow always point directly north? 5. Notice how your shadow changes with the season in early morning; at noon; in the evening. 6. How long is the longest night where you live? The shortest? Consult an almanac. 7. Which zone has the slightest change of seasons? Why? 8. Show why the common notion that within the Arctic and Antarctic circles there is everywhere six months of day followed by six months of night is a mistake. 9. What season is it now in Australia?

II. Latitude, Longitude, and Standard Time

1. Latitude and Longitude

Need of some way of locating places exactly. — In a study of geography, it is often necessary to locate places exactly. This is not so easy as it might seem. For instance, suppose we wish to state where London is situated; how would it be done? Of course, it would be easy to describe the general location of this city; but some more accurate way should be found.

How houses may be located in cities. — The difficulty is similar to that which arises in locating a place in a large city, where there are thousands of houses. No one person knows who lives in most of them, and if a stranger were looking for a friend, he might have much trouble in finding his house.

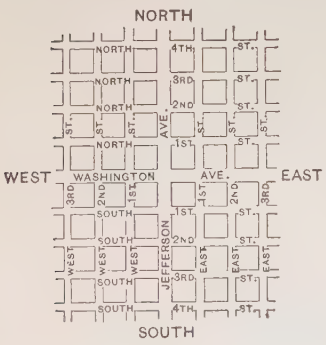


Fig. 238

A very simple means has been found for locating city houses. For example, a street running east and west may be selected to divide the city into two parts, as Washington Avenue does in Fig. 238. Any place north of this street is spoken of as being on the *north side;* any place south of it as being on the *south side.* The streets to the north of this central street are numbered as North 1st, North 2nd, North 3rd, etc.; those to the south of it as South 1st, South 2nd, South 3rd, and so on. Then if a man says that he lives on North 4th Street, we know at once that he lives on the north side, and that his house is on the fourth street from this central one.

But we need also to know on what *part* of North 4th Street this house is to be found. To answer that question, another street running north and south may be selected to divide the city into east and west sections. In Fig. 238, Jefferson Avenue is such a street. The streets on the two sides of it are numbered as East 1st, East 2nd, West 1st, West 2nd, etc.

Then if a man lives on the corner of North 4th and East 3rd streets, we know not only that his home is *north* of a certain line, but *east* of a certain other line. Thus the house can be located exactly.

How places can be exactly located on the earth. — Places upon the earth are located in much the same manner as in the city just described. The *equator* corresponds to the dividing street that runs east and west. The distance between the equator and each of the poles is divided into ninety parts (Fig. 239), each being about sixty-nine miles wide. This distance is called a *degree.* The sign for degrees is a little circle (°) placed at the right of a figure (Fig. 239).

How they can be located in a north and south direction

Lines are drawn upon maps and globes to represent these degrees. The lines on a globe extend completely around it from east to west, and are therefore circles. The first circle north of the equator, marked 1°, is about sixty-nine miles from that central dividing line; the one marked 2° is twice that distance, and so on. The north pole is 90° from the equator. The same plan is followed south of the equator. The distance from pole to pole is 180°, and the entire circumference of the earth, like that of any circle, is 360°.

All points on any one of these circles are the same distance from the equator and from each of the other circles. On that account these circles are called *parallels*. On Fig. 2, find the parallel for 10°; for 40°; what important cities are near the latter?

If one finds that a certain place is on the 8th or the 50th, or some other parallel, north of the equator, he knows how many miles it is north of that dividing line; for every degree is about 69 miles. San Francisco,

Fig. 239

for example, is close to the 38th parallel, and Chicago is close to the 42d (Fig. 11). Knowing this, you can easily see that Chicago is 4°, or about 276 miles, farther north than San Francisco.

Thus by the help of the parallels one can find how far any place is north or south of the equator. Instead, however, of saying that places are so many degrees *north or south of the equator*, we usually say that they are in so many degrees *north or south latitude*. San Francisco, for instance, is near 38° *north latitude* (abbreviated *N. Lat.*). *Latitude is distance north or south of the equator, measured in degrees;* and the parallel lines are called *parallels of latitude.*

Of course there are no marks upon the earth to show where these circles run. They are drawn on globes and maps, where they are of great use because they help to locate places. Small maps and globes cannot well show the entire ninety parallels on each side of the equator. That would make too many lines. For this reason, the parallels shown are usually several degrees apart. Examine some maps (such as Figs. 2 and 215) to see which ones are given. Near what parallel do you live?

How places can be located in an east and west direction

As in the city, some means must also be found for locating places east and west; for two points might be in 10° north latitude and still be several thousand miles apart. Show that this is true. Imaginary lines are used for this purpose, as before; but this time they extend around the earth from pole to pole (Fig. 239). These lines are called *meridians*.

In a city it makes little difference what north and south street is chosen from which to number the others. It is necessary only that a certain one be agreed upon. The same is true of these meridians. No one is especially important, as the equator is, and any one of them might be chosen from which to start. Indeed, different nations have selected different circles as the one from which to begin numbering. It is, however, important that all people agree on some one meridian to start from, so that all maps may be made alike. On that account, many countries begin their numbering with the meridian which passes through Greenwich, near London. The maps in this book follow that plan.

Beginning with the meridian of Greenwich, we measure off degrees both east and west. Thus there is a meridian 1° west, another 2°, a third 3°, etc. Going eastward, the meridians are numbered in the same way. Any

place on the third meridian *west* of Greenwich is 3° *west* of the principal meridian; if on the sixtieth meridian, it is 60° west.

Again, however, instead of saying that a place is so many degrees *east or west of the principal meridian*, we say it is in so many degrees *east or west longitude*. The place on the third meridian, just mentioned, is, therefore, in 3° west longitude. *Longitude is distance east or west of the principal meridian, measured in degrees.*

The distance around the earth from north to south, through both poles, is four times

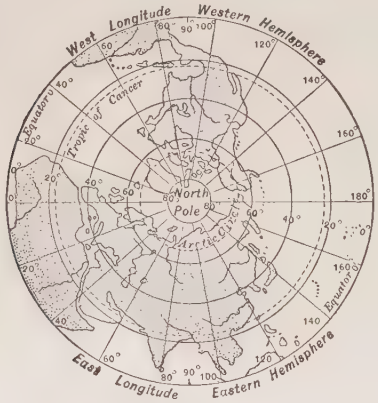


Fig. 240

A view looking down on the north pole, to show how the meridians come to a point at the north pole. Notice that if the 0° meridian were continued, it would unite with the meridian 180°.

90°, or 360° in all. The equator is likewise divided into 360 parts, or degrees. There are therefore 360 meridians, if they are drawn one degree apart. They are numbered up to 180° in both directions (Fig. 239). Thus, 180° E. Long. is the same as 180° W. Long. (see Fig. 239).

The meridians are not parallel, like the circles of latitude. They are farthest apart at the equator, where the number of miles covered by a degree of longitude is about the same as that covered by a degree of latitude. But all the meridians come together at the poles, as you can see on a globe or on Fig. 240. Therefore the length on the earth's surface of a degree of longitude becomes smaller toward the poles.

2. Standard Time

The differences in time between places. — If you were to travel from New York to San Francisco, you would find on arriving there that your watch was three hours too fast. The reason is that the rotation of the earth is from west to east. The sun is, on the meridian on the Atlantic coast, about three hours earlier than on the Pacific coast. Hence, when it is noon in New York, it is only about nine o'clock in the morning at San Francisco. The time steadily changes in going either east or west, so that no two places on an east-west line have exactly the same time by the sun. Formerly every city used its own sun time, or *local time*. This was a source of great trouble to travelers; for their watches were always wrong when they arrived at new places.

How trouble caused by these differences is now largely avoided. — In order to avoid this trouble, our continent has been divided into belts, throughout each of which the same time is used. Since this time is the standard for all, these belts are called *Standard Time Belts*. The belt which includes the Northeastern States, all but a small area of the Southern States bordering the Atlantic, and half of Ohio, is called the *Eastern Time Belt*. What are the others called (Fig. 233)?

In traveling across the country from New York City to San Francisco, one starts with his watch set at the standard time for the Eastern Time Belt. At length he comes to a place where the time is changed one full hour; then he sets his watch back one hour to *Central Time*. Going still farther west to

the *Mountain Belt*, he again sets his watch back an hour. What does he do when he reaches the *Pacific Belt?* By this arrangement, the same time is used over a very broad belt, and only a few changes of the watch have to be made. State how a watch would have to be changed when one goes eastward from San Francisco to New York.

How the time for each belt is fixed. — Our study of longitude helps us to understand what determines the places for changing this time. The earth makes one complete rotation every 24 hours, so that 360 degrees pass directly beneath the sun in the course of a day of 24 hours. Dividing 360 by 24 gives 15; that is the number of meridians, one degree apart, that the sun appears to pass over in a single hour. Therefore, when it is noon in a place on the 75th meridian, as at Philadelphia (Fig. 233), it is eleven o'clock just 15° west of this, or on the 90th meridian. When it is noon at one point on a meridian, it is noon all along that meridian.

This explains what has determined the boundary lines of the time belts. The time selected for the Eastern Belt is that of the 75th meridian; for the Central Belt, that of the 90th meridian, which the sun reaches one hour later. What meridian is selected for the Mountain Belt (Fig. 233)? For the Pacific Belt?

Each of these meridians runs through the *middle* of the belt whose time it fixes. Thus, the eastern boundary of the Central Time Belt is halfway between the 75th and 90th meridians, that is, 82½° W. Long.; and the western boundary is halfway between the 90th and 105th meridians, or 97½° W. Long. As a matter of fact, the boundaries of the time belts do not fall *exactly* on these meridians. It often happens that the meridians chosen for boundaries pass through very unimportant points, or even cross the railways far out in the open country. Instead of following the meridians closely, therefore, the boundaries of the time belts often pass through well-known cities. For instance, Detroit, Toledo, and Atlanta lie on the boundary between the Eastern and the Central Time belts.

Except along the exact center line of these time belts, standard time, of course, does not agree with local or sun time. Such disagreements, however, between standard and local time do not cause serious inconvenience when large areas agree to adopt the same kind of time. For this reason, it has been found easy in many parts of the world during recent years to use what is called *daylight-saving time* throughout the lighter half of the year. Since people ordinarily rise at an hour which is much closer to noon than the hour when they retire, daylight-saving time, by shifting the clock an hour ahead, enables entire communities to live according to their usual schedule as shown by the clock and yet to waste one less hour of daylight each morning. What can you tell regarding the arguments for and against daylight-saving time? What is the relation between daylight saving and conservation of fuel?

Facts to be especially well fixed. — 1. The meaning of latitude. 2. Of longitude. 3. The method by which places can be located accurately by a statement of their latitude and longitude. 4. The reasons for adopting standard time. 5. Explanation of the irregular boundaries of the standard-time zones.

Problems for independent study. — 1. Find how the streets of Washington have been numbered and lettered. 2. What is the latitude and longitude of Boston? Of Washington? Of Chicago? Of your home? 3. Find some cities that are on or

near the 42d parallel of latitude. 4. What place is in 25° N. Lat. and 81° W. Long.? What place is near 40° N. Lat. and 75° W. Long.? 5. Find places that have nearly the same latitude as your home. 6. Show on a globe, or map, where a ship would be when in zero latitude and zero longitude. 7. Examine a globe to see what meridian is a continuation of zero longitude on the other side of the earth. 8. Find the latitude of the tropic of Cancer; of the tropic of Capricorn; of the Arctic circle; of the Antarctic circle. 9. What is the latitude and longitude of the point on the earth exactly opposite your home; *i.e.* if you could pass directly through the earth, where would you come out on the other side? Show by a globe the error of the common idea that "the other side of the world" is China. 10. Examine some railway time tables to see how they indicate the changes in time. 11. What is the difference, where you live, between standard time and solar or sun time?

III. Winds and Rainfall

1. Winds

The problem before us. — In our study of North America, we have learned that the winds of different sections come from different directions. For example, in the West Indies, Central America, and southern Mexico, the winds blow from a generally easterly direction; but on the western side of the continent, all the way from California to Alaska, the wind blows quite as regularly from the west. In the eastern part of the United States, on the other hand, the winds are irregular in direction, although they blow more often from the west than from any other quarter. We shall now study the causes for these differences.

The movements of air caused by a hot stove. — It will help us to understand this subject if we first find what currents of air a hot stove causes in a room. The first thing that happens when a fire is kindled is that the air near the stove is warmed. First the warm air near the stove expands and becomes lighter. Then the cooler, heavier air in other parts of the room settles down and flows in toward the stove, forcing upward the warm, light air near it. This warm, rising air grows cooler as it comes in contact with the cool ceiling and the walls of the room. This makes it dense and heavy again; it then settles toward the floor at some distance from the stove, and once more moves toward it. In other words, the air keeps circulating in the room, rising when warmed and settling when cooled.

How the principal winds of the earth resemble these currents. — On the earth the broad torrid zone, which is warmed by the sun's rays, takes the place of the stove. The air above the heated surface of the earth in the torrid zone expands and becomes lighter, just as the air does above the stove. The cooler, heavier air to the north and south of the torrid zone then flows in and pushes the light air up and away. Such a flowing of the air is what we call *wind*.

This movement of the air is illustrated in Fig. 241. The letter **E** stands for the equator. The arrows represent the cooler air, north and south of the equator, as crowding in toward that section, then rising, and returning once more to the north and south.

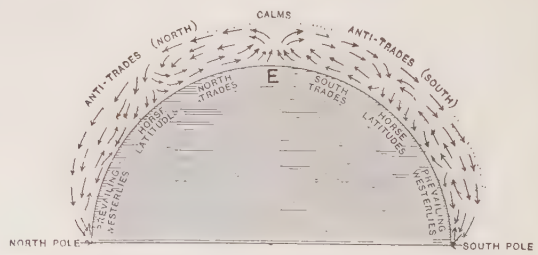


Fig. 241. — Diagram to show the movement of the greater winds of the earth

The trade winds and the anti-trades. — The air that flows toward the equator causes very regular winds called *trade winds*. These start both north and south of the equator, hundreds of miles away, and blow toward it day after day and month after month.

Their causes

The heated air is pushed up to a great height, and then flows back in the same direction from which it came. This forms the *return trade*, or *anti-trade winds* (Fig. 241). The atmosphere extends many miles above the earth, so that there is plenty of room for two winds, one above the other, blowing in different directions. Being cooled on account of expansion as it is forced upward, the air of the anti-trades slowly settles, some of it coming to the surface at about a third of the distance to the poles. There it spreads out, part continuing on toward the poles, and part returning to the equator as the trade winds. Point out the arrows that show these movements in Fig. 241.

If the earth stood still, the trade winds would blow directly toward the equator from the north and south; and the anti-trades would blow directly away from it. As you know, however, the earth rotates from west to east. This causes the trade winds to be turned from their straight course toward the equator. Those in the northern hemisphere are turned to the *right*, so that they blow from the *northeast* instead of from the north. Those in the southern hemisphere are turned toward the *left*, and therefore blow from the *southeast* instead of from the south.

Effects of the earth's rotation on the direction of these winds

The anti-trades are also turned toward the right in the northern hemisphere, where they blow from the southwest, and toward the left in the southern hemisphere, where they blow from the northwest.

Location of the great wind belts. — It is now easy to see why the West Indies, Central America, and southern Mexico receive such regular winds from the northeast. They lie in the belt of the northeast trade winds just described.

In the United States, Canada, Europe, and a part of Asia, the winds blow so often from the west, northwest, or southwest, that these lands are known as the belt of *prevailing westerlies*.

Regular winds, such as are found in North America, are likewise found in most other parts of the world. There are several *belts* of regular winds extending around the earth. Point out in Fig. 242 the belt of *trade winds* north of the equator. Point out the *prevailing westerlies*. Point out the two similar wind belts south of the equator.

The belts of calms and of light and variable winds. — Besides the four belts of winds just mentioned, there are three other belts in which light, variable winds alternate with periods of calm. The most important of these is called the *equatorial belt of calms* (Figs. 243–244), which is several hundred miles in width. This belt is situated where the trade winds from the northeast and those from the southeast die out. It is in this belt that the heated air in the torrid zone is rising. Since it is moving mostly *upward*, little wind can be felt, and this is, therefore, a belt of prevailing calms. What winds there are, are usually light and changeable.

Northern Mexico and southern California are situated in another belt of light winds with frequent calms. This is a belt where the air of the anti-trades is *settling* toward the earth; and settling air, like rising air, does not cause winds. This region is known as the *horse latitudes*. Find it on Figs. 243–244. Show the corresponding belt on the

Fig. 242

south side of the equator. (Figs. 243 and 244.)

Effects of the earth's revolution on these belts. — The belt of most intense heat is not always in exactly the same part of the earth. In June, when the sun is vertical at the tropic of Cancer, the belt of greatest heat lies north of the equator; and in December, when the sun's rays are vertical at the tropic of Capricorn, it lies farther south. As the belt of greatest heat thus shifts with the seasons, the wind belts and the belt of calms move also. (Figs. 243 and 244.)

2. Rainfall

Relations of winds to rain. — Knowing the wind belts that encircle the earth, we have a key to the principal rain belts, for the winds are the water carriers of the earth. Water that is evaporated from the surface of the oceans and of the lands is borne along in the air in

the form of vapor. It descends to the earth as rain or snow, falling in great abundance in some places, and scarcely at all in others.

Principal cause of rain. — To understand the cause for the change of vapor to rain or snow, it is necessary, first of all, to know that warm air can contain much more

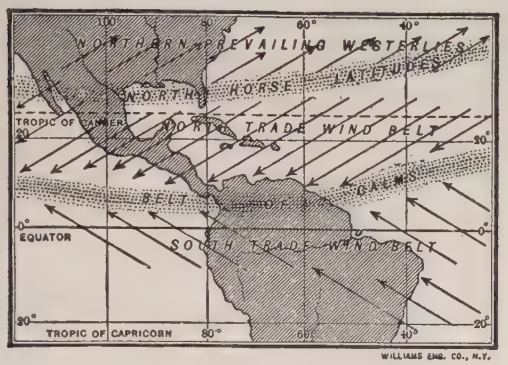


Fig. 243

Diagram to show the position of the trade winds belts and the equatorial belt of calms in summer.

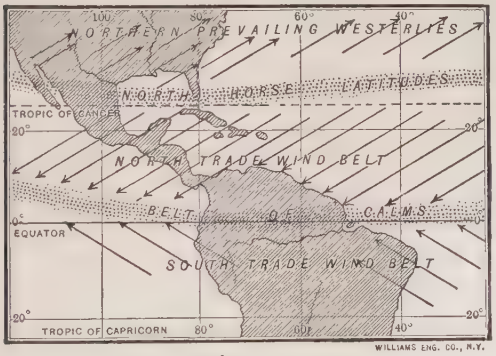


Fig. 244

Diagram to show the position of the trade winds belts and the equatorial belt of calms in winter.

vapor than cold air. For this reason, whenever air is cooled sufficiently, some of the water vapor which it bears is condensed. For example, dew forms on grass when the air near the ground grows cool in the evening. In a like manner, the vapor in our breath is condensed, thus forming a little cloud, when we breathe into the cold air of a winter day. Rain and snow are also caused by the cooling of air which contains vapor.

One important cause of the cooling of air is that it expands on rising above the surface. Perhaps you have noticed how cool the air feels as it rushes out from an automobile tire when you open the valve. The coolness is due to the expansion of the air as it comes out. In a similar way, when air rises above the surface of the earth, it expands, because there is less air above to press upon it. Then it grows cool, and some of its vapor is condensed to form clouds and raindrops.

This is the chief reason why winds from the ocean cause rainfall on mountain slopes and plateaus. The air is forced to rise in order to pass over the highlands, and that causes it to expand and grow cool. For the same reason, air that rises in the warm parts of the earth, like the equatorial belt of calms, also gives up vapor to form rain. Briefly — *when air is forced to rise, it expands and cools; and then rain usually follows.*

One reason for dry weather. — On the other hand, air that is settling grows warmer; this, instead of giving up its vapor, becomes dry and clear. Since there can be more vapor in warm than in cool air, such settling air currents become drier. They cause clouds to disappear, and water to be evaporated from the ground. This is the reason why the horse latitudes are arid belts; for, as you remember, the air in these belts is settling from above. Briefly — *when air descends, it grows warmer; then the sky is clear and the weather dry.*

Location of the regular rain belts. — These facts are well illustrated in the rainfall of North America. The northeast trade winds, having gathered a large amount of vapor from the ocean, deposit it on the windward or eastern slopes of the West Indies, southern Mexico, and Central America (Fig. 242). The western

In North America

slopes of the West Indies, however, receive a much smaller quantity of rain; and the western coast of Mexico is arid. Farther north the prevailing westerlies, having traveled a long distance over the Pacific Ocean, likewise cause heavy rains along the western coast of North America (Figs. 13 and 242). But these winds also lose much of their moisture in passing over the Western Cordillera; the land farther east, therefore, receives much less rain from this source. Northern Mexico and the southwestern part of the United States, lying within the horse latitudes, where the air is descending, also receive very little rain (Fig. 242).

Other regions that lie within the regular wind belts show the same conditions of rainfall. For example, note what heavy rains the northeast trade winds bring to northern South America and to southeastern Asia.

In other regions north and south of the equator

In western Asia and northern Africa, on the other hand, these winds deposit little moisture. They have been blowing a long distance over land, rather than over water, and have little vapor to deposit. They are, moreover, moving from a cooler to a warmer region, and are taking up more moisture. They are, therefore, *drying winds*. This accounts for the Sahara and certain other deserts.

The *prevailing westerlies* reach Europe, as well as North America, and cause abundant rainfall on the western coast. The three peninsulas of southern Europe, however, lie partly within the horse latitudes; and for this reason they receive little rain, especially in their southern portion.

By a careful study of Fig. 242, show how the rainfall south of the equator can be explained. Note whether the prevailing winds for each region that you study have been blowing over land or water; whether they are blowing toward a cooler or a warmer region; and whether they are forced to rise over mountain ranges.

The equatorial belt of calms is the most rainy of all the belts, because its hot, moisture-laden air is rising and cooling. After a clear night in that region, the sun usually rises in a cloudless sky. As the morning advances, and the heat grows more intense, the damp air rises more rapidly; then small clouds appear, which grow steadily until rain falls. Showers occur almost every day, increasing in the afternoon. When the sun sets, and less air rises, the clouds melt away, and the night is as clear as before. Our hot summer days, with heavy thunder showers in the afternoon and evening, illustrate the weather that is repeated, day after day, in this belt of calms.

In the equatorial belt of calms

You have already learned (p. 234) that the wind belts shift northward in summer and southward in winter. Many regions in the torrid zone are within the belt of calms during the summer months, and are swept by the trade winds in the winter months. In such places the year is thus divided into two seasons: (1) a wet season, when the region is in the belt of calms; and (2) a dry season, when the trade winds blow. Among the areas thus affected are North and South America from California (p. 131) southward to Argentina, central Africa, southern Asia, and the northern part of Australia. See Figs. 245 and 246.

Shifting of these rain belts

In the horse-latitude belts there are also wet and dry seasons, but the wet season comes in the winter owing to the shifting of the westerlies toward the equator in that season. Areas of winter rains are found in

southern California, in the Mediterranean lands, central Chile, and parts of southern Australia and South Africa.

Regions of irregular rains. — Thus far only the *regular* wind and rain belts have been considered. From what has been said, one might expect that the west winds, so dry after passing over the highlands of the western part of the United States, would continue eastward and cause our North Central and Northeastern States to be arid. As a matter of fact, abundant rain falls in this section, as shown by Fig. 18. We know, too, that both winds and temperature are quite changeable over this entire area. The reason for such changeable weather here is that this region is crossed by great storms, moving roughly from west to east. When such storms begin in the Northwest, there is a large area there with lighter air than that over the surrounding region. Such an area is called a *low-pressure area*, or a *low* (Fig. 247). The heavier air from the surrounding country flows toward this low-pressure area from all directions.

In eastern United States and Canada

1. The changeable weather here

The air that flows in is forced upward near the center of the low-pressure area. As it rises, the vapor condenses, forming clouds and rain, as in the belt of calms. Such an area of low pressure, with its clouds and rain, is known as a *cyclonic storm area*. Instead of remaining in one place, the cyclonic storms travel eastward, being carried along by the prevailing westerlies; indeed, they appear to be whirls, or *eddies*, in the prevailing westerlies, somewhat like the eddies in the current of a stream.

2. The movement of the cyclonic storms, and their extent

These storms bring most of the rain that falls in the United States and Canada east of the Rocky Mountains. The area upon which rain may be falling from the clouds of one of the cyclonic storms is sometimes very great. Indeed, places fully a thousand miles apart sometimes receive rain at the same time, from the same storm. As the storm moves eastward, the weather begins to clear and to grow colder in its western side (Fig. 249).

The vapor that causes the rain in these storms is brought from the Gulf of Mexico and the Atlantic Ocean, being carried by the winds for hundreds of miles, even into Canada.

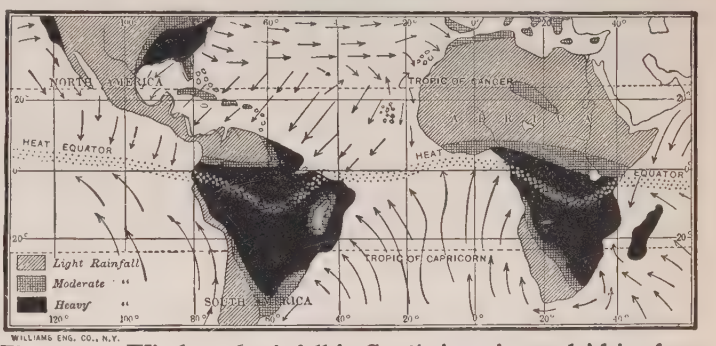


Fig. 245. — Winds and rainfall in South America and Africa from December to February

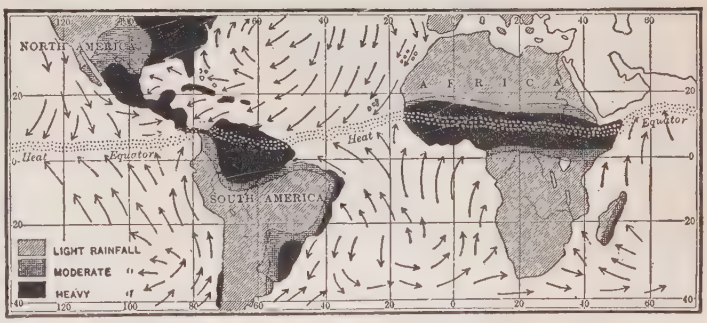


Fig. 246. — Winds and rainfall in South America and Africa from June to August

Compare with Figs. 243 and 244 to see how the belts of heavy rain have moved as the wind belts have shifted with the change of season.

Not only are rains brought by these storms, but also changes in temperature and in the speed and direction of the winds. Warm winds, blowing from the south toward the low-pressure areas, are the cause of the winter thaws and the summer hot spells which are common in the East and Middle West. It is chiefly during the hot spells that thunderstorms occur; also, in some places, *tornadoes*, often misnamed *cyclones*, in which the winds blow so fiercely that houses are torn to pieces.

3. Their effects on the weather

After a low-pressure area has passed eastward and the storm is over, the wind generally blows from the west. This causes cool, dry weather in summer and cold weather in winter. The severe drops in temperature that often occur are called *cold waves;* these, sweeping over the East and even into the South, often do great damage to fruit trees and delicate plants.

By watching the pressure of the air, as shown by instruments called *barometers*, it is possible to predict cyclonic storms; and since they always move toward the east, it is possible, by further study of the barometer and of the winds, to predict their course somewhat accurately, and thus to warn people of their approach.

4. Possibility of predicting these storms

This work is so important that the government employs a large force of men, stationed in different parts of the country, to observe the pressure of air, direction of wind, etc. A special branch of the Department of Agriculture, called the *Weather Bureau*, is in charge of this work. The observations are made at the same time at all stations, and telegraphed to a central office at Washington. The weather observations and predictions are then telegraphed to all parts of the country, so that one knows what kind of weather to expect a full day before it comes. Maps, called *weather maps*, are also sent out from the more important

5. How the predictions are made and how people are warned

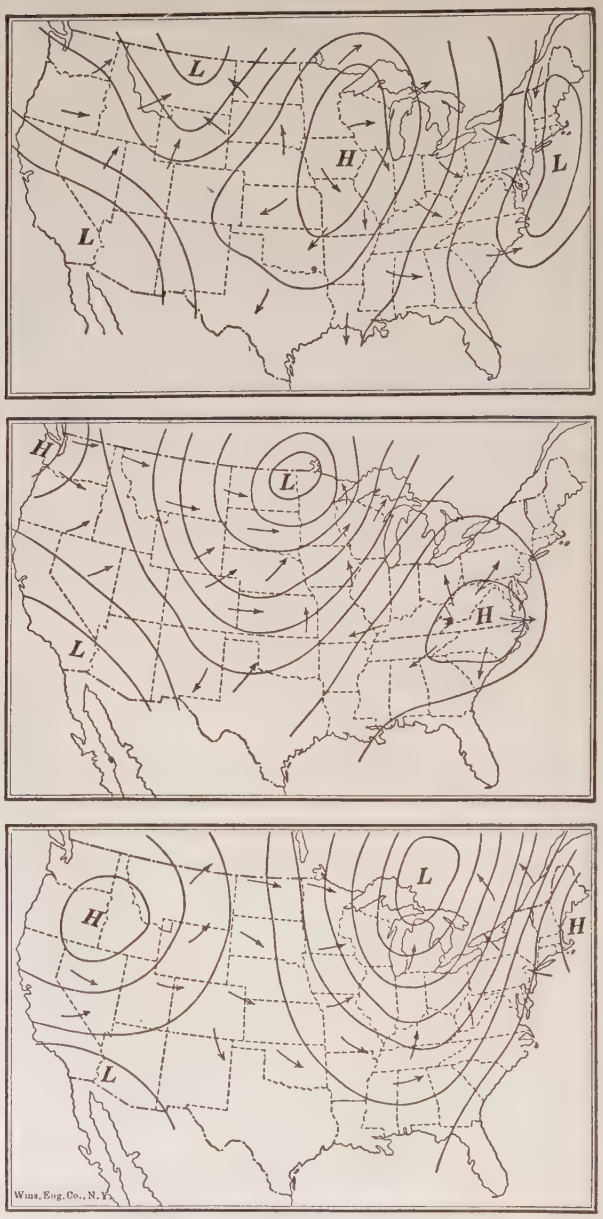


Fig. 247.—"Highs" and "Lows" in the United States on three successive days

Weather Bureau stations. Fig. 247 is made from such maps. It shows the eastward progress of an area of low pressure

by indicating its position on three successive days.

By the predictions of the Weather Bureau, farmers and gardeners are warned against damaging frosts, and sailors against severe storms. Hundreds of thousands of dollars and many lives are saved in this manner every year. Especially valuable service has been rendered by the Weather Bureau in predicting the fierce *hurricanes* that start in the West Indies and sometimes do great damage there, as well as on our own southern and eastern coasts.

Other regions of irregular rains in Europe

Since Europe, like the United States, is mainly in the belt of prevailing westerlies, it also is visited by cyclonic storms. Many of the storms that cross our country pass over the ocean and travel far into Europe and Asia, where their effects are similar to those in North America. Cyclonic storms develop also in the belt of prevailing westerlies in the southern hemisphere. For this reason the weather of southern South America and Australia resembles our own. Why cannot the same statement be made regarding the southern part of Africa? Examine the map to see.

Monsoons. — There are other causes besides cyclonic storms of interference with the regular winds of the earth, and therefore with the rainfall. One of these is the difference in temperature between land and water. When a large body of land, like a continent, becomes heated during the summer season, air from the cooler ocean tends to blow toward it for hundreds of miles. In winter, on the other hand, when the land becomes cooler than the ocean, the cold air over a vast area tends to move toward the sea. Such winds exist in Mexico and our Gulf States; but winds which thus blow in opposite directions in different seasons, are better developed in India than in any other part of the earth. It was here that they received the name *monsoon winds*. The name *monsoon* is now given to this class of winds wherever they may blow.

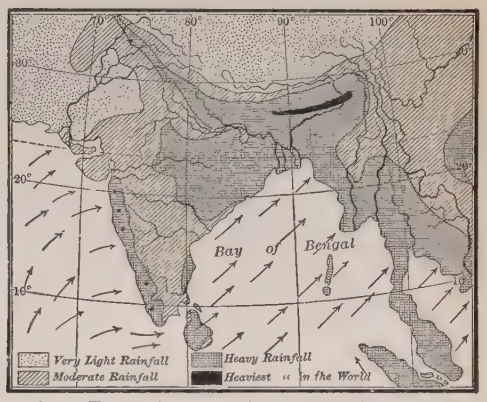


Fig. 248. — The winds and rainfall during the summer monsoon of India

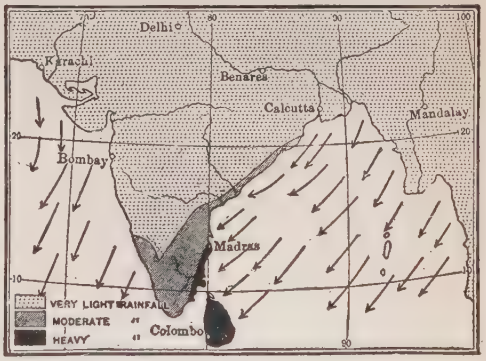


Fig. 249. — The winds and rainfall during the winter monsoon of India

Compare with Fig. 248, and notice how very light the rainfall is in one season, and how heavy it is in the opposite season.

The interior of Asia is so far from the ocean that there are naturally great changes in temperature from summer to winter. During the winter the heavy air over the cold land settles down as drying air, and presses outward beneath the warmer air that lies over the ocean. This produces dry winds from the land (Fig. 247). In summer, on the other hand, the air over the

cool water crowds in, raises the heated air of the continent, and produces ocean winds and rain (Fig. 248). The rainfall is especially heavy where the moisture-laden air ascends the steep slope of the Himalayas. Indeed, the region north of the Bay of Bengal receives a heavier rainfall than any other part of the earth (Fig. 401). The winter monsoon, on the other hand, is so dry that vegetation withers and the soil becomes parched and cracked.

Facts to be especially well fixed. — 1. The explanation of the trade winds. 2. Of the chief belts of calms. 3. The explanation of the seasonal shifting of wind belts. 4. The chief reasons for changes in the direction of winds in the belts of westerlies. 5. Location of the chief rain belts. 6. The movement of cyclonic storms, and their effect upon the rainfall of the United States.

Problems for independent study. — 1. Estimate the number of barrels of water that falls on an acre of ground, or upon a city block, in one year, where the rainfall is forty inches. 2. How is a movement of air secured in your schoolroom in order to ventilate it? 3. Watch the higher clouds to see in what direction they are moving. 4. Write an account of the changes in weather for five days in succession: the wind direction and force; the clouds; rain or snow; temperature; and, if possible, the air pressure.

IV. Distribution of Temperature

Why places in the same latitude may have different temperatures. — As a rule, the farther one travels from the equator, the colder it grows; but this is by no means always the case. There are several causes which interfere with this regular decrease in temperature toward the poles.

The presence of highlands is one cause. It is a well-known fact that high mountains have a cold climate, even though in the torrid zone; for the same reason, plateaus may be colder than lowlands farther from the equator.

A second cause is the fact that land warms and cools much more rapidly than water (p. 239). For this reason it becomes warmer than the ocean in summer, and colder in winter. Thus Minnesota has a *continental* climate (p. 64), with great extremes of heat and cold.

The winds are a third factor which greatly influence temperature. Where the prevailing winds are from the ocean, they cause an equable climate, as along the western coast of North America from California to Alaska (p. 232). Where they blow from the land, on the other hand, they are cool or cold in winter, and warm or hot in summer.

A fourth cause for such difference in temperature is found in the ocean currents (p. 243).

The temperature regions of the earth. — Now that we have studied the factors that influence temperature, we shall not be surprised to learn that the boundaries of the temperature regions of the earth are exceedingly irregular. Recall what you have already learned regarding the temperature regions of North America (p. 13). There are similar temperature regions in the other continents. The position of these will be studied in connection with each continent. Latitude has a greater effect upon temperature than any other one factor; consequently the temperature belts, like the zones, may be expected to extend around the earth in an east and west direction. This is in general the case. Some temperature regions, however, extend north and south, as do those along the eastern shores of the oceans. The reasons for the chief irregularities in the shape and area of these regions will be discussed in connection with each continent.

Their irregularity

Perhaps you may wonder, in your study of the maps of the temperature regions, how

their boundaries have been determined. Just what temperatures shall we call *hot*, and what *cold?* Some convenient temperatures are chosen by scientists who have made a study of climate. Thus in regions of *cool summers and extreme winters* the average temperature of no month in the year is above 50° Fahrenheit. In a similar way, a region where the average temperature of no winter month is below 50° may be called a region of *mild winters;* and one where the average of no summer month is higher than 68° is called a region of *mild summers.* Thus *mild* means *without extremes of temperature,* whether of heat or of cold. Regions whose average temperature in no month of the year falls below 68° are referred to as *always hot.*

How the boundaries of these regions have been determined

Maps showing such regions, of course, since they show only hot regions, cold regions, etc., cannot show just how hot the hot regions are or how cold the cold ones are. Yet the distinctions shown on these maps are the really important ones because the temperatures which have been chosen are those that affect agriculture and hence human life. Thus in regions of *cool summers and extreme winters* the growing season (if there is any such season) is too short for the maturing of crops. On the other hand, in the regions marked *always hot* the growing season, so far as the influence of temperature is concerned, is twelve months long, though in some hot regions, of course, a dry season interferes with the continuous growth of crops. Between the regions too cold for profitable farming and the tropics, both in the northern and in the southern hemisphere, the length of the growing season varies according to the distance from the equator, the altitude, and the nearness of large bodies of water. In the region of *extreme summers and mild winters* it varies from seven to ten or more months. It is shorter than this in the region of *extreme winters and mild summers* — so short, in fact, as to make agriculture difficult in the northern half of this region.

Relation between temperature regions and agriculture

Facts to be especially well fixed. — 1. The four most important factors that determine temperature. 2. How the boundaries of the temperature regions have been determined. 3. The connection between length of growing season and the temperature regions.

Problems for independent study. — 1. By comparing Figs. 12, 290, and 398, determine which of the temperature regions of the northern hemisphere appear to encircle that hemisphere completely. 2. Using Figs. 254, 457, and 468 in the same manner, solve the same problem with reference to the southern hemisphere. 3. What appear to be the most pronounced cases, on each of the six maps just referred to, of temperature regions that are little influenced by latitude?

V. Ocean Currents

The winds which blow over the ocean cause the water over which they blow to move in the same direction. This starts a current, or drift, of surface water. Where the winds blow steadily, as in the trade wind belts, there is a permanent drift of water in the direction of the prevailing winds. In this way a great system of ocean currents is formed (Fig. 250). These have an important influence on the temperature of the earth.

Main cause of ocean currents

In the eastern part of the Atlantic, where the trade winds blow, the surface water on the two sides of the equator drifts slowly in the direction of the trade winds; that is, toward the equatorial belt of calms (Fig. 242). The water then moves westward, as a great *Equatorial Drift,* until it reaches the coast of South America, which interferes with its

Causes of the North Atlantic Eddy

course. There the drift of water is divided, a part being turned southward, while the greater portion proceeds toward the northwest.

The part that flows northwest turns toward the right; and the part that flows into the South Atlantic turns to the left. The northern drift keeps turning to the right, and therefore, instead of continuing

Course of the Gulf Stream

ern coast of South America enters the Caribbean Sea and then passes into the Gulf of Mexico. This forms a broad, deep, gently flowing current through these inclosed seas, which are so nearly surrounded by warm, tropical lands that the water grows even warmer than it was before.

After swirling slowly round the Gulf of

Fig. 250. — The principal ocean currents of the world

along the American coast, swings out into the Atlantic toward Europe. Continuing to turn, it then passes southward, and finally returns to the trade wind belt, where it started, having made a complete circuit. This circular drift of water in the North Atlantic is called the *North Atlantic Eddy*. Coming from the equatorial region, the water in this huge eddy is warm.

A portion of the drift of water which moves toward the northwest along the northern coast of South America enters the Caribbean Sea and then passes into the Gulf of Mexico, the water escapes between Cuba and Florida. The current then becomes known as the *Gulf Stream* because it comes from the Gulf of Mexico. It soon leaves the American coast, however, and flows northeast toward northern Europe. It broadens rapidly and mingles with the western part of the great North Atlantic Eddy. In crossing the Atlantic, this combined current, or drift, is pushed along by the prevailing westerlies, so that it reaches the shores of northern

Europe and even enters the Arctic Ocean. In this part of its course the current is called the *West Wind Drift*. Some idea of its volume may be gained from the fact that it carries many times as much water as all the rivers of the world together.

Course of the Labrador Current, and some of its effects

Some of this water returns in a cold current, called the *Labrador Current*, which flows southward along the northeastern coast of North America. Starting from among the islands of northern North America, it flows past the coast of Labrador, Newfoundland, Nova Scotia, and New England as far as Cape Cod. Like all ocean currents in the northern hemisphere, it is turned toward the right; that is, since it flows southward, toward the west. This causes it to follow our coast very closely, keeping nearer our shore than does the Gulf Stream. This current explains why an east wind in New England is likely to be chilly.

Where the cold and warm currents approach each other, dense fogs are common. The reason for this is that warm, humid winds from the Gulf Stream are chilled in crossing the Labrador Current. This causes some of the vapor to condense and form fog particles. The region near the coast of Nova Scotia and Newfoundland is one of the foggiest in the world, and therefore dangerous to vessels.

Similarity of currents in the North Pacific

In the Pacific Ocean, as in the Atlantic, the water is driven before the trade winds. Thus a broad drift is formed, moving westward in the belt of calms. Then a warm current swings to the right past Japan, crossing the ocean toward Alaska. This is called the *Japanese Current*. Continuing to turn to the right, this ocean drift passes southward to complete the vast eddy. There is also a cold current from the north, between the Japanese Current and the coast of Asia, corresponding to the Labrador Current in the Atlantic, though smaller and not so cold.

From what has been said, we see that the *northeastern* coasts of both North America and Asia are swept by ocean currents from the cold north. On the other hand, the *northwestern* coasts of Europe and North America are approached by warm drifts of water from the south. What effects would you expect these currents to have on the land regions near which they pass? In answering this question, remember the direction of the prevailing winds.

Eddies of the southern oceans

In the South Atlantic, South Pacific, and Indian oceans, there are eddies similar to those of the North Atlantic and the North Pacific. There is one very important difference, however. In the southern hemisphere the currents turn to the *left* instead of to the right. Some of the water of these eddies joins the broad *West Wind Drift* of the distant southern ocean; but much of it turns northward until it once more reaches the trade wind belt, thus completing the eddies.

Effects of ocean currents

The effects of ocean currents upon human life are many and various. They influence the temperature of land regions leeward from them, largely because they warm or cool the winds that sweep over them. For this reason, currents in the belts of prevailing westerlies exert much more influence over lands to the east of them than they do over lands to the west of them. Although it was formerly supposed that the cold currents which sweep down along the northeastern coasts of North America and Asia were in large measure respon-

sible for the cold temperatures that prevail in these regions, it is now believed that their cooling effect is confined to the brief periods during which the winds blow from off the sea. On the other hand, northwestern Europe and the western coast of North America all the way from Alaska to California are greatly moderated by the prevailing west winds which here blow over wide expanses of comparatively warm water. We have already studied this effect in detail in the case of North America (pp. 16 and 184). For the effect upon Europe, see p. 284.

Facts to be especially well fixed. — 1. The chief causes of ocean currents. 2. The courses of the most important currents in the North Atlantic and the North Pacific oceans. 3. The effects of the most important ocean currents upon climate.

Problems for independent study. — 1. What course might a vessel take in order to be carried from Europe to America and back again by ocean currents? 2. How do vessels avoid running into one another in dense fogs? 3. What would be some of the effects upon the climate of the northern hemisphere if the position of the cold and warm currents were interchanged? If the currents remained as they are, but the direction of the prevailing winds were reversed?

PART III. SOUTH AMERICA

	Form of Government	Area in Square Miles	Population	Largest City	Population
Argentina	Republic	1,153,100	9,839,000	Buenos Aires (1925)	2,310,000
Bolivia	Republic	514,200	2,990,000	La Paz (1924)	118,000
Brazil	Republic	3,285,300	30,636,000	Rio de Janeiro (1920)	1,158,000
British Guiana	British colony	89,500	301,000	Georgetown (1924)	56,000
Chile	Republic	290,100	3,755,000	Santiago (1920)	507,000
Colombia	Republic	440,800	6,618,000	Bogota (1923)	166,000
Dutch Guiana	Dutch colony	54,300	136,000	Paramaribo (1924)	46,000
Ecuador	Republic	119,000	2,000,000	Guayaquil	100,000
Falkland Islands	British colony	6,500	3,000	Stanley (1921)	900
French Guiana	French colony	34,700	44,000	Cayenne (1921)	10,000
Paraguay	Republic	98,000	1,000,000	Asuncion (1921)	100,000
Peru	Republic	532,000	5,550,000	Lima (1925)	190,000
Uruguay	Republic	72,200	1,640,000	Montevideo (1925)	422,000
Venezuela	Republic	393,900	2,412,000	Caracas (1920)	92,000
South America		7,083,600	66,924,000		

Questions. — 1. How many of these countries are larger in area than Texas, our largest state? 2. How many are more populous than New York, our most populous state? 3. Determine from this table, by arithmetic, which South American country has the densest population. 4. Which country contains nearly half the population of South America?

I. General Facts

Area, and distribution of population. — While the area of South America is more than two thirds that of North America, its population is less than one half as great. Compare their areas and populations as given in the tables on this page and on p. 13.

The distribution of the population of South America is perhaps still more uneven than that of North America. There are two points of difference that are especially striking. In the interior of the continent, where the rainfall and vegetation, as shown in Figs. 255 and 256, are abundant, there are very few inhabitants. The Amazon Basin has not, thus far, attracted settlers to any such extent as has the Mississippi Basin. Notice in Fig. 256 how much of the continent is still forested. Again, the principal population in many sections is found some distance inland rather than on the coast. Point out some of the countries in which this is the case. The coast of tropical South America has had far less attraction for settlers than has the coast of our continent.

Questions on Fig. 251. — 1. How does the area of lowland compare with that in North America (Fig. 1)? 2. How do the two continents compare in regularity of coast line? 3. What effect would you expect this to have upon commerce? 4. How does South America compare with North America in the number of large lakes?

SOUTH AMERICA
PHYSICAL MAP
Scale of statute miles
0 100 200 400 600 800 1000
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
DEPTHS IN FEET
Sea level to 5000
Below 5000
CARIBBEAN SEA
ATLANTIC OCEAN
PACIFIC OCEAN
CENTRAL AMERICA
Equator
Tropic of Capricorn
Longitude West from Greenwich
ANDES
PLATEAU OF BOLIVIA
PLATEAU OF MATTO GROSSO
BRAZILIAN HIGHLANDS
GUIANA HIGHLANDS
LLANOS
Pampas
PLATEAU OF PATAGONIA
Amazon R.
Mouths of the Amazon River
Cape Horn
Strait of Magellan
Cape St.Roque
C. Branco
Cape Frio
TRINIDAD I.
FALKLAND ISLANDS
SOUTH GEORGIA I.
SANDWICH ISLANDS
JUAN FERNANDEZ ISLANDS
ST. FELIX I.
ST. AMBROSE I.
WILLIAMS ENGRAVING CO., N.Y.

Fig. 251

SOUTH AMERICA
POLITICAL MAP
Scale of statute miles
0 100 200 400 600 800 1000
Capitals of Countries ⊙
Railroads
CARIBBEAN SEA
ATLANTIC OCEAN
PACIFIC OCEAN
CENTRAL AMERICA
COLOMBIA
VENEZUELA
ECUADOR
PERU
BOLIVIA
BRAZIL
PARAGUAY
CHILE
ARGENTINA
URUGUAY
BRITISH GUIANA
DUTCH
FRENCH
Equator
Tropic of Capricorn
Bogotá
Medellin
Manizales
Buenaventura
Cali
Quito
Guayaquil
Cuenca
Iquitos
Cerro de Pasco
Lima
Callao
Oroya
Cuzco
Arequipa
Mollendo
Arica
Iquique
Antofagasta
Mt. Sorata
La Paz
Mt. Illimani
Cochabamba
Oruro
Potosi
Sucre
Santa Cruz
Matto Grosso
Plateau of Matto Grosso
Goyaz
Manaos
Obidos
Santarem
Para (Belem)
Maranhao (Sao Luiz)
Ceara
Natal
Parahiba
Pernambuco (Recife)
Joazeiro
Maceio
Bahia
Porto Seguero
Caravellas
Diamantina
Victoria
Petropolis
São Paulo
Cape Frio
Nictheroy
Rio de Janeiro
Santos
Asuncion
Salta
Tucuman
Corrientes
Santiago del Estero
Cordoba
Santa Fe
Parana
Rosario
San Luis
Buenos Aires
La Plata
Bahia Blanca
Valparaiso
Santiago
Talca
Concepcion
Valdivia
Castro
Puerto San Antonio
Blanca Bay
C. Corrientes
C. San Antonio
Montevideo
Plata R.
Porto Alegre
Mouths of the Amazon River
Para R.
Orinoco R.
Amazon R.
Rio Negro
Madeira R.
Purus R.
Jurua R.
Tapajos R.
Xingu R.
Tocantins R.
Parnahiba R.
Araguaya R.
Paraguay R.
Rio Grande
Uruguay R.
Colorado R.
Negro R.
Chubut R.
Strait of Magellan
Punta Arenas
Cape Horn
Gulf of Penas
Gulf of Guayaquil
Gulf of Venezuela
Gulf of Darien
Gulf of Panama
Lake Maracaibo
Lake Valencia
Delta of the Orinoco River
Port of Spain
La Guaira
Caracas
Puerto Cabello
Barranquilla
Cartagena
Colon
Panama
Panama Canal
Georgetown
New Amsterdam
Paramaribo
St. Laurent
Cayenne
Trinidad (Br.)
Curaçao (Dutch)
Barbados (Br.)
Guadeloupe (Br.)
Dominica (Br.)
Martinique (Fr.)
Santa Lucia (Br.)
Lesser Antilles
Vol. Chimborazo
Vol. Cotopaxi
Vol. Antisana
Mt. Aconcagua
Juan Fernandez Is. (To Chile)
Queen Adelaide Archipelago
Chonos Archipelago
Chiloe I.
Falkland Islands (British)
South Georgia I. (British)
Sandwich Is. (British)
Trinidad I.
Longitude West from Greenwich
110° 100° 90° 80° 70° 60° 50° 40° 30° 20° 10°
80° 70° 60° 50° 40°
10° 0° 10° 20° 30° 40° 50°
224
WILLIAMS ENGRAVING CO., N.Y.

Fig. 252

Questions on Fig. 252. — 1. Judging from the number of railroads, which would you expect to be the leading countries of South America? 2. Which countries suffer the greatest handicaps to foreign commerce? 3. By comparison with Figs. 12 and 13, decide which countries enjoy the greatest variety of temperature and rainfall.

How can we account for the smaller population of South America, and for the distribution of its inhabitants?

Disadvantages for development that South America has suffered. — The location of a continent has much to do with its importance.

The disadvantages due to its location

If it lies in a portion of the earth that is always hot, for example, its people do not have the same energy as those in more temperate regions. The weather does not permit it. Nor are they likely to be as free from disease, because the higher temperature and greater moisture favor the greater development of disease germs. The wet, hot tropics have always been the backward regions of the earth. South America suffers greatly because of its climate. In Fig. 254 note about how much of the continent lies in the belt where it is *always hot.*

The difficulty of transportation to and from it

The difficulty of reaching South America has been another hindrance to its development. The great nations of the earth are almost entirely in regions where there are distinct winters. Show that this is true. If their people go to South America, they must cross the hot, moist belt, or at least a large part of it. Travel is more comfortable

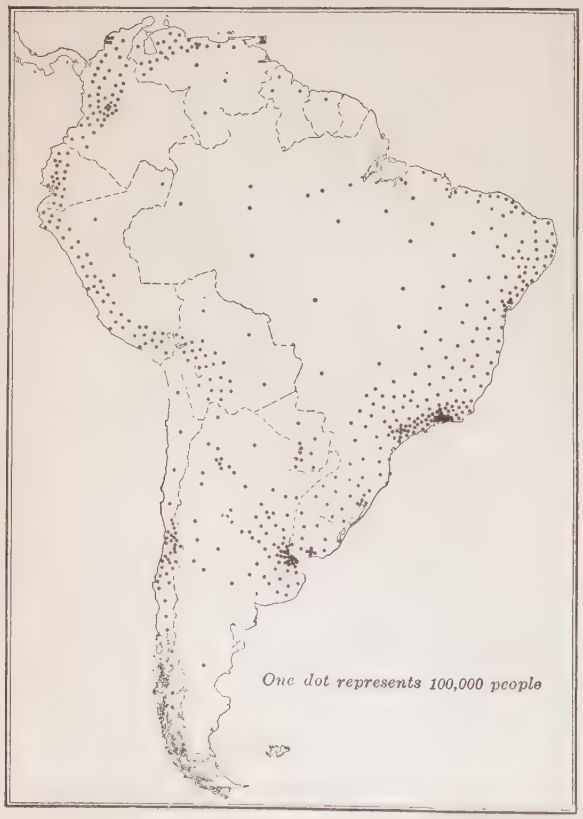


Fig. 253. — Distribution of population in South America

Fig. 254. — The temperature regions of South America

and convenient where such great changes in temperature are not encountered. If they ship freight, the added expense and inconvenience may be much greater. For example, in the damp climate of tropical South America iron and steel goods are likely to rust rapidly, leather goods to mold, wooden furniture to swell, and foods to spoil. Special precautions must be taken against such dangers on the way.

The landing, too, may be difficult, for there are few natural harbors and few harbor improvements. At many points vessels must be met some distance from shore by *lighters*, and both freight and passengers must be transferred from one to the other. Partly on this account, it is far easier to ship goods from New York to Europe than to South American ports that are no more remote. All nations, in order to progress, must have foreign commerce, especially if they do not produce both raw products and manufactured goods. The difficulty of carrying on foreign commerce has hindered the development of South America and made it less attractive to home-seekers than North America.

Transportation within the continent is also difficult. The Andes Mountains are a great

After Gannett and Office of Farm Management, U. S. Dept. of Agric.

Fig. 255. — Annual rainfall in South America

Compare this map with Fig. 256 to see the explanation of the different types of vegetation. By reference to Fig. 242, see how many of the regions of heavy and of very light rainfall you can account for. Is there a larger or smaller area of heavy rainfall than in North America (Fig. 13)?

After Schimper, modified and simplified

Broad Leaved Temperate Forests.
Now being removed to prepare land for tillage.
Grasslands — Llanos in Venezuela, Savannas in Brazil, Pampas in Argentina.
Pampas mostly tilled. Good grazing lands.
Semi-desert, Scrub Woodlands, and Cold Treeless Regions
Barren deserts shown thus
Tropical Forests — Very little tillage. Suitable for plantation agriculture.
Collecting of gums, medicinal plants, nuts, and some lumbering.
Alpine vegetation.
Some grazing.

Fig. 256. — The plant regions of South America

BRAZIL AND THE GUIANAS
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 100 200 300 400 500
Capitals of countries ⊙ Railroads
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
CARIBBEAN SEA
ATLANTIC OCEAN
PACIFIC OCEAN
VENEZUELA
COLOMBIA
PERU
BOLIVIA
PARAGUAY
ARGENTINA
CHILE
URUGUAY
BRAZIL
GUIANA (BRITISH)
GUIANA (DUTCH)
GUIANA (FRENCH)
Equator
Tropic of Capricorn
Longitude West from Greenwich
WILLIAMS ENGRAVING CO. N.Y.
1128

Fig. 257

Questions on Fig. 257. — 1. Show how the position and surface features of the Guianas make it advisable to group them with Brazil rather than with Venezuela. 2. By comparison with Fig. 253, see how the districts of densest population correspond with those of greatest railroad mileage. 3. Why do you suppose there is a railroad from Guajara Mirim to Porto Velho?

---

hindrance to the construction of highways and railroads. Our Southern Pacific Railroad crosses the Sierra Nevada at an altitude of about 7,000 feet. On account of the much greater height of the Andes, and the fact that these mountains form the boundary between separate nations, it is not likely that transcontinental lines will ever be numerous or pay as well in South America as in North America.

The difficulty of transportation within the continent

Again, both railroads and wagon roads are especially difficult to keep in repair. Snowslides and avalanches are a constant source of difficulty in the mountains; the heavy rainfall in the tropical lowlands causes dangerous washouts, and the moisture and heat together produce in these regions such rank vegetation that a neglected road soon becomes covered up and lost. In Fig. 252 note how few railroads have been built. The entire mileage in South America is only about 55,000, while that in North America is nearly 325,000.

Nor have the rivers been by any means as valuable for transportation as those in North America. Only one of them has any considerable population along its course. Which one is it? Name the other principal rivers, and state what you observe about the population near them (Fig. 253).

Lack of coal is still another handicap. Want of good harbors, railroads, and wagon roads would cripple manufacturing in any region. When coal is lacking, too, the prospects for the development of industry are especially poor. There are, to be sure, small deposits of coal; but until more of it is discovered in widely distributed places, manufacturing cannot flourish. There is therefore little work of the kind that awaits immigrants to North America. In fact, North America is nearer Europe, the great source of home-seekers, and on that account will continue to attract new settlers until it becomes too densely populated to offer a good livelihood.

Lack of coal

South America was first settled by the Spaniards and Portuguese. During the last 300 years these nations have not kept pace with those of northwestern Europe and North America in industrial progress. Their methods of agriculture, manufacturing, and transportation have been backward, and the education of the masses has in some of these countries received little attention. They transplanted their manners and customs to the New World, and were slow to change them.

Slowness of people to adopt new ways

When America was discovered, Spain was the most powerful country in Europe, and expected the lion's share of the New World. At the same time Portugal was prominent, and sent out many explorers. Some of these laid claim to the eastern coast of South America. In order to prevent trouble between the two nations, the Pope declared that all territory east of a certain line, which was near the 36th meridian, should belong to Portugal, and all west of it to Spain. The line was later pushed westward to the 44th meridian, but it was at least partly owing to this declaration by the Pope that Brazil became Portuguese, while the greater part of the continent fell to Spain.

1. Source of early European settlers

The only portion colonized by other nations is that called Guiana, which is now divided among the British, Dutch, and French. Each of these three European countries got possession of some of the islands to the north (Fig. 215), and later came to hold part of the mainland near by as a colony. Spanish is still the common language for most of the continent, while Portuguese is confined to Brazil.

In some of the countries the whites are far outnumbered by Indians and people of mixed blood. One reason for this is that not so many Europeans have emigrated to South America as to North America. No doubt its location in the tropics and difficulties of transportation have helped to keep them away. In recent years, however, there have been large numbers of German and Italian immigrants besides the Spanish and the Portuguese.

2. The small number of whites compared with the number of other inhabitants

The character of the early Indians is another reason for the smaller number of whites. The Indians that were first encountered by European settlers in North America were in the hunting and fishing stage of development. They were not used to a fixed home and steady work. On that account they could not make profitable slaves. On the extensive uplands of South America, however, the Indians had advanced farther; they were accustomed to agriculture and mining — in other words, to hard labor. For that reason it was easier to compel them to work for others. Accordingly, instead of being driven out or killed off, they were enslaved by the whites. Their numbers steadily increased, and when slavery was abolished they became the greater part of the free people in such districts.

While the three Guianas are colonies, all the other countries of South America are republics. A great majority of the people, however, in several of the countries of South America can neither read nor write. They are therefore too ignorant to take an active share in the government. It is plain, therefore, that such countries are not republics as we understand that term; the real work of government is done by a few leaders, who may or may not be progressive.

3. Lack of responsibility in government

II. Tropical South America

1. Brazil and the Guianas

Possibility of the Amazon Basin helping to feed the world. — The United States has always produced most of its own food and sent large quantities abroad. If its population increases as rapidly in the future as it has in the past, the time will soon come when it will have little to spare; in fact, when it cannot raise enough for home use. What are we to do then? And where are the nations of Europe to look for their food supply? Heretofore the Mississippi Basin has been a source of food for North America and Europe. Can the Amazon Basin become a new source, perhaps far surpassing that of the Mississippi in agricultural products?

Seriousness of the question

Few persons realize the extent of this region; it has about twice the area of the Mississippi Basin. Moreover, the conditions most favorable to plant growth — namely, heat, moisture, and fertility of soil — are found here in the highest degree so that the luxuriance of its vegetation far surpasses that of the Mississippi Basin.

Superiority of the Amazon Basin over the Mississippi Basin for vegetation

That does not necessarily mean that plants grow larger here than elsewhere, or live

longer; for the very abundance of vegetation checks the growth of any one kind, and decay is especially rapid in such a climate. The giant trees of California are far larger and older than any known in the Amazon Valley. Nor can all plants be grown to advantage. Apple and peach trees and many others of our fruits do not mature there; neither do our most important grains, such, for example, as corn and wheat. They thrive in the hardier climate of the temperate zones.

The greater luxuriance of vegetation means greater rapidity, quantity, and variety of growth on a given area. Many kinds of fruits flourish there, only a few of which are familiar to us, such as bananas and pineapples; many varieties of vegetables flourish there; also rice, sugar cane, cacao, and dozens of other foods that are strange to us now, but which we could learn to eat, just as we have recently learned to eat bananas (p. 202). The Amazon far surpasses the Mississippi Basin in the variety of its vegetation.

© Publishers' Photo Service

Fig. 258. — A dugout canoe on one of the branches of the Amazon River, Peru

The density of the tropical forests makes land travel difficult in the Selvas (Fig. 251). Travel is almost entirely by boat. Small ocean steamers may ascend the Amazon to Iquitos. River steamboats are used above Iquitos and on many of the tributaries. Dugouts like the one in the picture are common all along the Amazon.

The chief difficulty in the way of greater production

There is one great difficulty, however, in the way of extensive production: the white man cannot thrive there. The mouth of the Amazon is at the equator, and in all that vast basin the sun's rays are always nearly vertical. This fact compels him to avoid heavy work and to remain in the shade most of the day.

The dampness makes the heat even more oppressive. At Para it rains from one to five hours nearly every day; and when it rains in the tropics, it pours. For the explanation of such tropical rains, see p. 236. In such a hot, humid climate the white man is not merely uncomfortable; his health is impaired. His blood becomes thin, and he is subject to fever and other tropical diseases.

Effects of this difficulty

1. On the density of population

The effects of this difficulty are seen in both the numbers and the occupations of the inhabitants. The largest city in the Amazon Basin is Para, with 236,000 inhabitants. The next is Manaos, 1,000 miles up the river, with 76,000; and the third is Iquitos, 1,600 miles still farther up, with about 20,000. Locate these. Name the three largest cities in the Mississippi Basin and give their populations. Fig. 253 shows that the whole Amazon Basin has only

two or three million inhabitants, while the Mississippi, with only about half the area and less productiveness, has between forty-five and fifty million.

© E. M. Newman

Fig. 259. — A rubber tree in the Amazon Basin

In this picture we see how the latex, or rubber milk, is collected in small cups hung beneath cuts in the bark. The rubber trees are widely scattered through the tropical forest. The latex is collected and carried to a central point, where it is dried down to a gummy mass ready for transportation to Para or other river ports.

2. On the leadership of the rubber industry

Although vegetation is so luxuriant, and the conditions for plant growth are very favorable, there is little farming. The one great industry has for many years been the collection and transportation of rubber. For a long time Brazil produced more than half the world's supply. Although it produces at the present time about the same amount as formerly, its output is only a small part of the total world production each year, because its production of rubber is now exceeded by that of other tropical countries which formerly produced little or none (p. 428).

The trees whose latex produces the rubber do not grow in groves, but are scattered through the dense forests all the way from the mouth to the source of the Amazon and over a large part of its basin. There are many species of trees whose latex can be hardened into rubber, but from only one of these is much collected in the Amazon Valley. The natives are employed to tap the trees, collect, and evaporate the latex so as to get the solid rubber, and take it to warehouses along the larger streams. From these it is shipped down the river to Iquitos, Manaos, and Para.

During the busy season the rubber workers usually live alone in little huts in the woods and follow paths from tree to tree. Their number is suggested by the fact that when the wet season prevents work in the forest, Iquitos, the smallest of the three rubber centers, has a population of about 30,000 instead of 20,000, the usual number. The pro-

duction of rubber in scattered areas is practically the only occupation throughout this vast area.

There seem to be only two possible ways of making the Amazon Basin highly productive. One is to establish plantation farming on a large scale, under the control of white men. The natives alone cannot be depended upon to develop the region; but they will work under the direction of white men. White men, therefore, who can stand the climate for at least a few years must be relied upon to establish large estates employing hundreds of men. They have already planted many rubber trees on the lower Amazon, and have established some promising cacao and sugar plantations there. They could supply the money and intelligence that are necessary, while avoiding the heavy physical labor, which would be done by natives under the guidance of carefully chosen overseers. Tractors and other labor-saving machinery could be introduced. If such measures for sanitation were taken as have proved so valuable in the Panama Canal Zone and in Cuba, including means for securing pure drinking water and for destroying insect pests, white men might find the life more bearable. This plan shuts out the immigrant with little or no capital; but it may be the means of solving the problem.

Possible solutions of the difficulty

The other possible solution is to encourage the immigration of Chinese or Japanese or Hindus. These peoples have shown remarkable energy and intelligence in independent farming and gardening in some of our own states, and can stand the hot climate better than white men.

The most important part of Brazil, and its attractions. — The most important part of Brazil at present is the southeastern coast and the highland back of it, the area extending from the boundary of Uruguay northeast to Pernambuco.

Its location and climate

© E. M. Newman

Fig. 260. — A coffee plantation in Brazil

In the background are the coffee trees from which the coffee is picked. In the foreground are the drying flats where the coffee is dried in the sun. Some plantations employ hundreds of workers.

Estimate this distance. What do you observe about the density of population in this section (Fig. 253)?

While most of it is in the tropics, there are two means of relief from the heat. The southeast trade winds blow very regularly against this coast (Fig. 242), reducing its temperature. Back of the narrow coastal plain there is also a vast plateau whose altitude of 2,000 to 3,000 feet affords considerable relief for that area. Name several cities located directly on the coast.

The leading industry is the raising of

coffee. Brazil grows approximately four fifths of all the coffee in the world. The center of the industry is Sao Paulo. Many of the coffee plantations are as large as some of our counties, and the owners take great pride in handing down such large estates undivided from father to son. Do you consider such a practice a good or a bad thing for the country?

The leading industry, and cities dependent upon it

© *Newman Traveltalks and Brown & Dawson, N. Y.*

Fig. 261. — Coffee warehouses at Santos

The coffee plantations sometimes employ more than 1,000 men, who are engaged in cultivating, pruning, spraying, and, finally, in harvesting the crop. The trees produce berries, each of which contains two coffee beans surrounded by pulp. The berries are first picked and dried, after which the beans are removed and dried still further. One tree may produce as many as four or five pounds of coffee, but most trees yield from one to three pounds. It is packed into bags for shipment, Santos being the principal city for its export. A large quantity, however, is shipped from Rio de Janeiro. The importance of its coffee shipments and its unusually fine harbor have helped to make Rio de Janeiro the leading city of Brazil and to justify its selection as the national capital.

Other occupations north and west of Rio de Janeiro

The area northeast of the coffee region produces tropical and semi-tropical crops. The most prominent are sugar cane, cotton, and cacao. The leading cities are Bahia and Pernambuco. Locate them.

Mining and grazing are carried on to some extent in the interior in the highlands. These industries may become of great importance in the near future. That time can hardly come, however, until many more railroads are built. Why?

Its location and development

Promise of the most recently settled portion. — Brazil extends a long way southwest of the coffee region into the temperate zone. Estimate the length of coast lying within that belt. The southern half of this area is in many respects the most promising part of Brazil. To what part of the United States does this section correspond in its temperatures (Figs. 12 and 254)? Many thousands of Germans, Austrians, and Russians have recently settled here (p. 258), dividing the land into small farms, building good roads, establishing schools, and introducing many of the conveniences to which they were accustomed in their native countries. It is an extremely prosperous region and is in many ways the most attractive part of Brazil.

The peculiar advantage it secures to Brazil

This new settlement strengthens Brazil in one very important way. The two leading industries of the nation are the production of rubber and of coffee. The rubber trees, however, are in danger of destruction, owing to the great demand for their latex and the care-

© *Publishers' Photo Service*

Fig. 262. — A portion of the city and harbor of Rio de Janeiro

Rio, the name by which the city is commonly known, is the second city in South America in size and has one of the largest and most beautiful harbors in the world. The harbor is seventeen miles long and fifteen miles wide. The entrance is less than a mile wide and lies between mountains the most striking of which is Sugar Loaf, the cone-shaped mountain in the middle background of the picture.

less methods used in gathering it. We have already seen (p. 254) that Brazil is no longer the chief rubber-producing country of the world. It is quite possible that this industry, for the reasons just given, may not only continue to shrink in importance when compared with the output of other regions, but actually diminish in Brazil.

Again, the coffee plantations grow little besides coffee; they represent the one-crop kind of farming, just as our Southern States once did (p. 111). They are liable to suffer, too, in the same way. If the coffee trees were ever seriously damaged — as might happen — great suffering would result. Thus Brazil's dependence on rubber and coffee as her main products renders her prosperity insecure.

The newly developed section in the south helps to meet this danger. Both semi-tropical and temperate crops thrive here. Name a few of each kind. Grazing is also extensively developed. If rubber and coffee decline in importance, this region can do a great deal to preserve the prosperity of the nation.

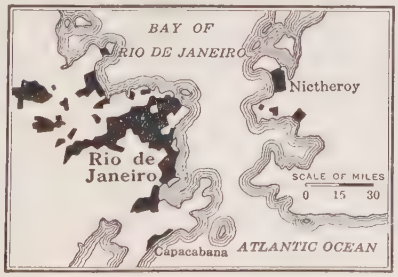


Fig. 263. — Rio de Janeiro and vicinity

The danger it brought during the World War

This section has been a source of danger as well as a protection. The settlers, as we have seen, are mainly Germans and

Austrians. German has been the language in many of the schools and in ordinary business. Laborers who could not speak German have found it difficult to get employment. When the World War began, many of the settlers opposed any measures that were unfavorable to Germany; indeed, they were suspected of planning to become a German colony. The poor connection with other parts of Brazil favored such a break. One railway runs from this section to the coffee region (Fig. 257); but the only way of reaching Bahia, or Pernambuco, or Para, is by the sea. About how far is it to each of these cities? The great importance of railways as an aid in the proper government of a country is well illustrated in this case.

The Brazilian government, however, had sufficient strength, energy, and courage to hold this movement in check; not only that, but to declare war against Germany at the same time. Brazil is the only country of South America that actually entered the war.

The undeveloped condition of the Guianas. — The slight importance of the Guianas is suggested by the fact that they have a total population of less than a half million, although they have been settled for 300 years. The most important of the three divisions is British Guiana; but even here the interior has been little explored; and the low coast land is too hot and humid for Europeans. The chief industry is agriculture; the leading exports are sugar and rice. In the interior highlands, especially in British and French Guiana, there are important deposits of minerals, which, like those of Argentina (p. 275), have not yet been extensively mined. British Guiana, moreover, like Arkansas (p. 119), has immense deposits of bauxite, the ore from which aluminum is made.

2. The Northern Andean Countries

(Venezuela, Colombia, Ecuador, Peru, and Bolivia)

Our special interest in these countries. — Two of these countries, Venezuela and Colombia, border the Caribbean Sea for a long distance. For about how many miles?

Why we have had a special interest in Colombia and Venezuela

Since the completion of the Panama Canal, we have an added interest in that sea and the countries surrounding it; for unfriendly relations with the latter might endanger our possessions. Recall any steps that we have taken to protect them.

Certain difficulties have brought us into especially close relations with these two countries. When we obtained the Canal Zone from Panama, we aroused the distrust of the Colombians. Only a short time before, Panama had been a part of Colombia, and the Colombians believed that we had encouraged her in her revolt from the mother country in order that we might the more easily secure control of the isthmus. The fact is, however, that the people of Panama had long been dissatisfied with the government of Colombia, and had frequently attempted revolution.

Our government has gone to the aid of Venezuela on two important occasions. One was a long-standing dispute between that country and England concerning the western boundary of British Guiana. The other concerned the payment of debts that she owed to several European nations. In both cases the United States was of great aid in bringing about a settlement. These close relations have interested us particularly in the character of these peoples and in their prosperity.

Fig. 264. — A portion of Caracas, Venezuela

Caracas is located 3,000 feet above sea level in a valley in the Andes. The temperatures at Caracas are moderate throughout the year. The city is quite modern; many of the principal streets are paved, and there are telephone and telegraph systems and street railways.

Our new interest in the Pacific coast countries

The Canal has brought our more densely populated states so much closer to the Pacific coast countries that we have a new interest in them. Before the Canal was opened they could be reached from New York only by sailing around South America, a voyage that was both difficult and dangerous. The passage through the Strait of Magellan is very winding, with dangerous rocks, heavy mists that shut out the view, and strong winds and ocean currents that drive vessels out of their course. The route around Cape Horn is still longer, though not so dangerous.

With the Canal, however, these difficulties are avoided, and the distance is greatly reduced. How much nearer is Guayaquil to New York by way of the Panama Canal than around Cape Horn (Fig. 495)? By being nearer our neighbors than formerly, we gain an important advantage over Europe. Estimate on the same map the distance from Guayaquil to Liverpool. We can expect, therefore, to visit and trade with these nations much more extensively in the future.

Our need to trade with them, also, has increased. Since we are likely to import large quantities of food in the near future, and to require new markets for our increasing manufactures, we shall want to buy from these nations, and sell to them, on a large scale.

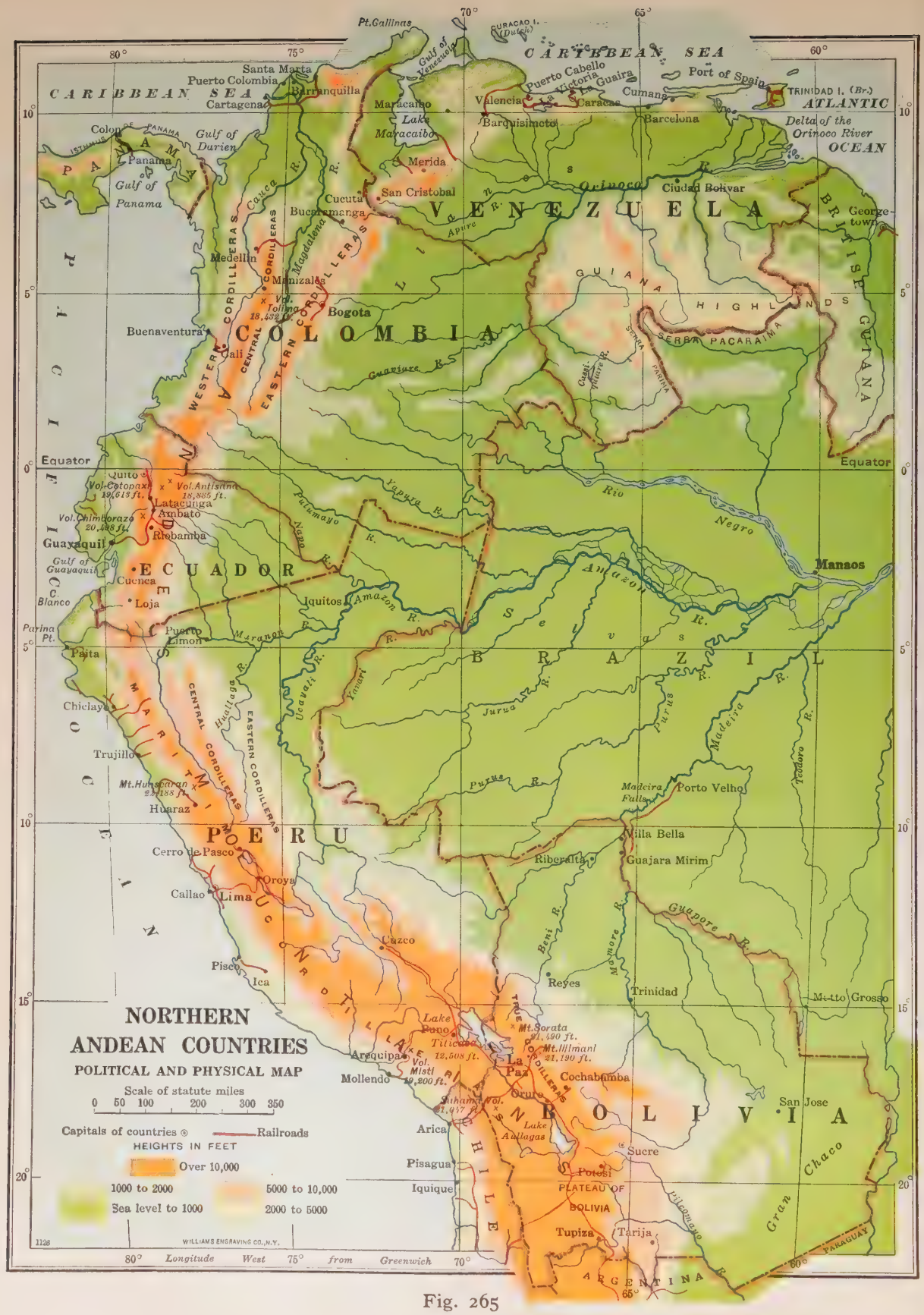

NORTHERN ANDEAN COUNTRIES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300 350
Capitals of countries
Railroads
HEIGHTS IN FEET
Over 10,000
1000 to 2000
5000 to 10,000
Sea level to 1000
2000 to 5000
WILLIAMS ENGRAVING CO., N.Y.
1128
Longitude West from Greenwich
CARIBBEAN SEA
ATLANTIC OCEAN
PACIFIC OCEAN
COLOMBIA
VENEZUELA
ECUADOR
PERU
BOLIVIA
BRAZIL
PANAMA
Gulf of Panama
Gulf of Durien
Panama Canal
Santa Marta
Puerto Colombia
Barranquilla
Cartagena
Pt. Gallinas
Curaçao I. (Dutch)
Gulf of Venezuela
Maracaibo
Lake Maracaibo
Puerto Cabello
Valencia
Victoria
La Guaira
Caracas
Barquisimeto
Cumana
Port of Spain
Trinidad I. (Br.)
Barcelona
Delta of the Orinoco River
Merida
San Cristobal
Cucuta
Bucaramanga
Orinoco R.
Ciudad Bolivar
Georgetown
British Guiana
Apure R.
Medellin
Manizales
Vol. Tolima 18,432 ft.
Bogota
Buenaventura
Cali
Western Cordilleras
Central Cordilleras
Eastern Cordilleras
Cauca R.
Magdalena R.
Guiana Highlands
Serra Pacaraima
Guanapi R.
Guaviare R.
Equator
Quito
Vol. Cotopaxi 19,613 ft.
Vol. Antisana 18,885 ft.
Latacunga
Ambato
Vol. Chimborazo 20,498 ft.
Riobamba
Guayaquil
Gulf of Guayaquil
Cuenca
C. Blanco
Loja
Parina Pt.
Puerto Limon
Paita
Yapura R.
Rio Negro
Manaos
Iquitos
Amazon R.
Selvas
Marañon R.
Ucayali R.
Yavari R.
Jurua R.
Purus R.
Madeira R.
Tapajoz R.
Madeira Falls
Porto Velho
Villa Bella
Riberalta
Guajara Mirim
Chiclayo
Trujillo
Mt. Huascaran 22,188 ft.
Huaraz
Cerro de Pasco
Oroya
Callao
Lima
Pisco
Ica
Cuzco
Beni R.
Mamore R.
Guapore R.
Reyes
Trinidad
Matto Grosso
Lake Titicaca
Mt. Sorata 21,490 ft.
Mt. Illimani 21,190 ft.
Arequipa
Vol. Misti 19,200 ft.
La Paz
Cochabamba
Mollendo
Oruro
Vol. Sahama 21,047 ft.
San Jose
Lake Aullagas
Arica
Sucre
Pisagua
Potosi
Iquique
Plateau of Bolivia
Tupiza
Tarija
Pilcomayo R.
Gran Chaco
Paraguay
Argentina
Atacama Desert
Chile

Fig. 265

Questions on Fig. 265. — 1. What natural feature is common to Venezuela, Colombia, Ecuador, Peru, and Bolivia? 2. How many mountain peaks, named on this map, are higher than any in North America (Fig. 1)? 3. Which of these countries has the greatest railroad mileage? 4. Where on this map are two great river systems very near to each other? Until 1925 it was supposed that these actually joined.

Prospect of their meeting our hopes in regard to trade. — Any nation must be reasonably prosperous to buy or sell extensively. How prosperous, then, are these countries? And what is their prospect for growth?

They are as unfavorably located in latitude as the Amazon Basin. Note where the equator crosses Ecuador; yet owing to their altitude they largely escape the extreme heat of the Amazon Basin. Along most of the coast from eastern Venezuela to southern Peru there is a low plain varying from a few miles to several hundred in width. The temperature there is high. But in most sections one soon begins to ascend on going inland, and a large part of these countries is a plateau varying from 9,000 to 14,000 feet in altitude. In Fig. 265 note the area over 10,000 feet. Several of the mountain peaks, as noted above, are higher than any in North America.

How they largely escape the handicap of the Amazon Basin

On account of the high altitude the temperatures on this plateau are similar to those of Mexico City (Figs. 12 and 254). Even though the sun is so nearly overhead (Fig. 236), there is perpetual spring, a most delightful climate. On that account most of the inhabitants, particularly the whites, live on the highlands (Fig. 253).

The snow line is about 16,000 feet, or more than three miles, above sea level. This is a very great altitude; and the variety of temperature conditions below such an elevation permits a great variety of vegetable products, unless the rainfall is insufficient. In the lower Orinoco Valley the luxuriant grass makes cattle raising profitable; indeed, grazing here is capable of development on a far larger scale than the present.

Their variety of climate

© *Publishers' Photo Service*

Fig. 266. — A cattle ranch in Colombia

High up in the Andes above the forest region there are many thousands of square miles of good pasture land. How do the temperatures here compare with those on the lowlands?

Tropical products are raised in the valley of the Magdalena River in Colombia, along the coastal plains of Colombia and Ecuador, and on the lower eastern slopes of the Andes in Peru and Bolivia in regions where the rainfall is heavy. See Fig. 256 for the distribution of tropical forests; Fig. 255 furnishes the

Their agricultural products

explanation. Chief among these products are sugar, bananas, and rice. The region about Guayaquil is famous for its cacao. For many years nearly half of all the cacao in the world was grown in this locality, but in recent years other tropical regions have outstripped it in cacao production.

Ascending 2,000 or 3,000 feet, one finds coffee growing on the slopes, and there is considerable cotton and tobacco. Higher still, potatoes, barley, wheat, corn, garden vegetables, and other crops of the temperate zone flourish. The broadest plateaus are those in Bolivia, where grasslands support great numbers of sheep, alpacas, llamas, and vicunas, all of them valuable for their wool.

In some portions of these countries the rainfall is insufficient for agriculture except by irrigation. For example, the coastal plain of Venezuela is generally dry because the northeast trade winds that blow over it do not precipitate their moisture until they begin the ascent of the mountain slopes southwest of this region. Western Peru and Bolivia are also dry (Fig. 255), for this region is on the lee side of mountain ranges in the belt of southeast trade winds. On the irrigated lands of western Peru, near the coast, cotton, rice, and sugar cane are grown. The high plateau lands in Bolivia are so cool that temperate-zone products are raised wherever irrigation is practiced.

© E. M. Newman

Fig. 267. — Copper smelters at Oroya, Peru

This city, at the end of the state railway, is high up in the Andes, in the rich mineral region of Peru. Locate it on Fig. 265. Gold, silver, mercury, lead, zinc, and many other ores are found in this region. Some of the silver and gold mines have been worked for many hundreds of years.

Their forest and mineral products

The types of trees vary also with the altitude. On the well-watered lowlands are dense forests containing many kinds of dyewoods and cabinet woods. The rubber tree is common here also. Iquitos, one of the centers for rubber (p. 254), is in northeastern Peru. Other products are quinine, vanilla, and sarsaparilla. High up on the slopes of the Andes are such trees as are common in temperate latitudes.

It was the precious metals that first attracted the Spaniards to the Andean countries, and mining has been important ever since. Gold and silver are found in many places; there is copper in Peru and tin in Bolivia, besides a great number of other minerals, including small deposits of coal. The heavy tropical rains are a valuable aid to mining, for they cut away the soil and rock and thus expose the mineral veins to the prospector.

There are, however, two serious obstacles to trade with us. One is the character of the people. A large proportion of the inhabitants are Indians and persons of mixed blood. Recall some of the reasons for this.

Two serious obstacles to trade

1. Character of the people

So small a number of whites means that the standards of living are low. Even the cities, such as Quito, for example, present a poor appearance, the streets being generally narrow and unpaved, and most of the buildings unattractive. In the country, conditions are even less comfortable. The houses are usually barren huts with dirt floors; clothing is ragged and soiled; and agricultural and mining implements are of the crudest sort.

© *Underwood and Underwood*

Fig. 268. — A part of the main business street in Barranquilla, Colombia

Locate this city on Fig. 265. Why does it have a large trade with the interior of Colombia? Tell how one may reach Bogota from this city. In what language is the sign in the picture?

The perpetual spring, that is to us so delightful, is perhaps partly to blame, for such weather easily undermines one's energy. The great altitude is, perhaps, another reason for this lack of ambition. At an elevation of 10,000 feet one unaccustomed to high altitudes cannot run or play games as he can at sea level; one's breath comes short and exhaustion soon follows. Whatever the cause, it is a fact that most of the people in these countries move about slowly and do little work.

The other obstacle to extensive trade with these countries is their lack of transportation facilities. Since the mass of the people live at least one or two miles above sea level, goods sent to them from abroad must be carried a long distance uphill; and goods sent abroad by them must be transported just as far downhill. Owing to these facts, the chief cities have grown up in pairs: one on the coast to receive and ship out products; and the other on the highlands to distribute goods received and to collect the products of the country for export. It is interesting to locate these twin cities and to notice the railroads that usually connect them.

2. Difficulties of transportation

a. Dependence of the many pairs of cities upon each other

In Venezuela they are La Guaira and Caracas. Find them on the map (Fig. 265). In Colombia they are Barranquilla and Puerto Colombia, near the mouth of the Magdalena, and Bogota, far inland. Estimate the distance between these coast cities and Bogota. The river and railways together connect the two; but transportation between them is so poor that goods have to be transshipped at least half a dozen times on the way. In Ecuador Guayaquil is the port, and Quito, 165 miles distant, is the

inland city. In Peru the most important port is Callao, connected by rail with Lima, the capital. Mollenda is the leading coast town in southern Peru, the shipping point for goods to and from Arequipa. Since Bolivia has no seacoast, it must depend upon the neighboring countries for ports. What are some of its chief cities, and, as shown by the railroads, what ports does it use? Most of the harbors of these coast towns are very poor (p. 249), and the towns themselves are unsanitary. Guayaquil was long known as a pesthole (see p. 266); and La Guaira's reputation is hardly better.

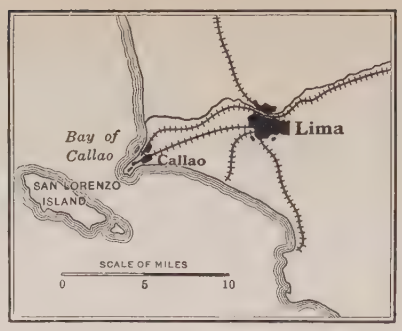


Fig. 269. — Lima and Callao

b. Small railroad mileage

The construction of these railroads and transportation upon them are necessarily very expensive. Why? Delays, also, are frequent, on account of washouts and avalanches. Yet these countries are almost entirely dependent upon these few ports for outlet. Bolivia, however, has a natural route for the commerce of the eastern lowland by way of the Madeira River. Trace this on Fig. 265. What obstruction is there on the river

© *E. M. Newman*

Fig. 270. — La Paz and Mt. Illimani, Bolivia

La Paz lies in a deep valley on the eastern slopes of the Andes more than 12,000 feet above the sea. At this great altitude the summers are short and cool. The picture shows how barren the slopes of the valley and the mountains are. What is the rainfall of this portion of Bolivia? La Paz was founded more than fifty years before the settlement of Jamestown. Its inhabitants have always depended largely upon mining for a living.

and how is it overcome? How far is Guajara Mirim from the Atlantic Ocean (Fig. 265)?

In the entire distance along the coast from eastern Venezuela to southern Peru there are hardly more than a dozen railroads that lead up on to the plateau. How many can you count in Fig. 265? How many miles long do you estimate this coast line to be? How far apart, then, are these railroads, on the average?

c. Difficulties of transportation by roads and trails

Although good highways have been under construction in some districts since about 1916, good wagon roads are still nearly as scarce as railways. Many years ago Ecuador started to build one from Quito to Guayaquil; but the workmen stopped after completing 115 miles of it, and it was not completed until 1908. Can you imagine why it was not finished promptly? Recall what has been said about the difficulty of building railroads and maintaining them.

It is fairly safe to say that a majority of all the people in these countries have never seen a well-built dirt road, to say nothing of a paved one. In that case, how do they get about? And how do they transport goods? The first answer is that they go about very little. Why should they? The second is that when they do travel, or carry goods, they follow the most primitive methods imaginable.

For instance, a man living on the plateau bought a small piano abroad that was landed at a little town on the coast far from any railroad. It was wrapped carefully in burlap; a long, strong pole was firmly lashed to each side; then eight men, two at each corner, lifted it by slipping their shoulders under the ends of the poles, and bore it away. Eight more men followed, who after a time relieved the first eight of their burden. Thus the sixteen men trudged slowly along, hardly setting the piano down during a half day at a time. In this way they journeyed for 200 miles.

© Underwood and Underwood

Fig. 271. — A pack train of llamas at Cerro de Pasco, Peru

Llamas are commonly used as pack animals in Peru and Bolivia. What indications do you see in this picture that there is an Indian population there?

It is clear why pack animals, such as the llama and the burro, are so important in these countries. Where paths or trails are the only transportation routes, a considerable portion of the burdens must be carried on their backs. The packages must on this account be reasonably small and very well packed. Heavy pieces of mining machinery and large plate-glass windows would be impossible; even a sewing machine or a full barrel of oil might cause trouble.

These facts give some idea about the trade we can expect with these countries. Some

commodities are imported by us in fairly large quantities; for example, cocoa and Panama hats from Ecuador, tin from Bolivia, and coffee, sugar, and tropical fruits from several of them. We should like more of these products, but cannot get them. Our exports to these countries are still less, because the needs of the inhabitants are very few. We send them flour and other foodstuffs, petroleum, clothing, and some other kinds of manufactured goods; but in small quantities. We should like to send them far more, but what use have the mass of the people for automobiles, or wagons, or fine furniture, or cook stoves, or laundry machinery, or fine clothing? Until they are greatly changed they are not likely to desire even farm implements of a modern sort.

Effect of these obstacles upon our trade with them

While the prospect for trade seems poor, recent events bring some encouragement. White men from abroad have been making many experiments in these countries, some of which are proving very successful. Grazing in the valley of the Orinoco has been encouraged by the erection of slaughtering and refrigerating plants, and that section may thrive as it never has before. During the last thirty years Americans have been developing banana plantations near the coast of Colombia east of the Magdalena River, with good results. The copper ore, mined and smelted by Americans at Cerro de Pasco in Peru, is proving very valuable. Although they are 12,000 feet above the sea, there are about 12,000 natives and 150 Americans at work there, the latter serving as overseers, office men, and directors. At that altitude the air is so rare that no one moves about rapidly and only the very healthy dare undertake heavy labor. Yet the success of mining there gives hope that many other mines will be opened in this rich mineral region. Very recently, also, Guayaquil, under the guidance of our countrymen, has been cleaned up and made a fairly healthful city. Many Europeans also are showing great interest in these countries and are doing their utmost to encourage progress, for they see that every advance means more commerce.

Reasons for encouragement

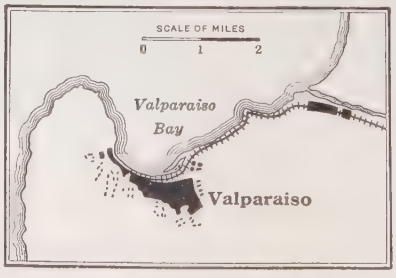


Fig. 272

III. Temperate South America

Leadership of this part of the continent. — The part of South America lying in the temperate zone contains two of the three leading countries of the continent; namely, Argentina and Chile. What two smaller countries does it also contain (Fig. 275)? In this section are three out of the four leading South American cities—Buenos Aires, Santiago, and Montevideo. Locate these. What is the fourth?

Similarity between Chile and our Pacific coast states. — Chile is sometimes called the "shoe-string republic" because it is so long and narrow. Its length is about 2,700 miles; if it were placed alongside our western coast, it would reach from the southern end of Lower California in Mexico to Juneau in Alaska. Its average width is only a little more than 100 miles. In spite of its narrowness, its area is nearly equal to that of our three Pacific coast states, and its population is three fourths as great.

In area, population, and surface features

In many respects there is a close similarity between

that country and the Pacific coastal region of North America. Along a considerable portion of the Chilean coast there is a low range of mountains corresponding to our Coast Ranges and the mountainous islands off the coast of British Columbia; and the lofty Andes form its boundary on the east, corresponding to the Sierra Nevada-Cascade ranges and the Coast Range in Canada. Between these two mountain systems is a long, narrow valley corresponding to the Valley of California and the lowland extending northward through Oregon and Washington to Puget Sound; and south of 42° S. Lat. is an "Inside Passage," similar to the Inside Passage to Alaska.

The climate, also, is very similar. The part nearest the equator, like southern California, gets little wind from the ocean (Fig. 242), and is therefore arid (Fig. 255). But the rainfall increases toward the south, being heavy in southern Chile as in Washington and western British Columbia. Thus the winds affect the two regions in the same manner.

In climate and agriculture

The Great Valley in Chile, which is about 600 miles long and averages fifty miles in width, lies between these two extremes and, like the Valley of California, must be irrigated over much of its area. Only in its southern portion is the rainfall sufficient for agriculture. The lofty Andes, however, supply the needed water in abundance, like the Sierra Nevada and the Cascades. The district in which Santiago is situated also has winter rains, as does California. Why? In what temperature regions is Chile (Fig. 254)?

The agricultural products of the two regions are much the same. Recall those of the Pacific coast states (pp. 140 and 148). The more common cereals and garden vegetables flourish in Chile, as well as many kinds of fruit. Among the latter, grapes are especially common, as in California; and in the southern part of the valley, where it is cooler, apples are abundant, as in Oregon and Washington.

© Publishers' Photo Service

Fig. 273. — The harbor of Valparaiso

Vessels find little shelter in this harbor when the wind is from the north or northwest. Can you tell why? In the background one can see vessels at anchor. These will load or unload from lighters.

The southern portion of the country contains extensive forests, but these, unlike those of western North America, have not proved valuable for lumbering, the woods being so soft that they decay rapidly

Yet Chile lacks one great advantage that our Western States enjoy; it has no good harbors. The principal port on all the Chilean coast is Valparaiso (Fig. 273), which is scarcely a harbor at all and is unworthy of comparison with

Some of the differences

our own Western harbors. No doubt many other differences in appearance and customs would seem striking to a resident of California who might visit Chile. Can you suggest some of them? Keep in mind the mixture of races, the peonage system, which is very common (p. 193), and the prevalence of other Spanish customs.

Why Chile greatly surpasses the other Andean countries in importance. — While Chile is much smaller than any of the other Andean countries except Ecuador, there is no area in any of them that compares with the Great Valley of Chile in fertility and development. Santiago, the capital and chief city, with a population of 507,000, is near its northern end, with Valparaiso as its port (Fig. 275). Note how many other towns of importance there are, and how many railroads connect them. Note, also, the railroad extending across the Andes from Valparaiso to Buenos Aires. It is the only transcontinental line in South America, though there are two shorter railway systems that cross the Andes farther north. The railway which extends along the interior valley has more than 2,800 miles of track. Chile has in all more than 5,400 miles of railway, which is greater than the mileage in all the other Andean countries combined.

The productive character of the Great Valley

© *Publishers' Photo Service*

Fig. 274. — A deep cut on the Trans-Andean Railway, near Uspallata Pass

What cities does this railroad connect? What cities does it pass through? In the winter the trains have much trouble with snow in the higher portions of the route across the Andes. What are the winter months here?

The delightful climate of this valley, together with the other advantages it affords, is the chief explanation of the greater importance of Chile.

Character of the people

But the character of the people is also a factor. It is estimated that forty per cent or more are of pure white stock, most of the remainder being *mestizos*, or of mixed blood. The natives make up only a small part of the population. Such a large proportion of people of European origin has exerted a marked influence. Between 1860 and 1920 about 50,000 Europeans, mostly Germans and French, emigrated to this land. Do you consider this a large amount of immigration?

In mineral wealth, with one exception, Chile has no great advantage over the other

---

Questions on Fig. 275. — 1. The southernmost cities of the world are shown on this map. Name them. How do they compare in latitude with London? Leningrad? Stockholm? 2. How does the area over 10,000 feet in elevation compare with that in North America (Fig. 1)? 3. With what mountains in South Dakota (Fig. 77) may the Sierra de Cordoba be compared? Why? 4. From their railroad mileage, what conclusion do you draw regarding the comparative importance of Uruguay and Paraguay?

TEMPERATE
SOUTH AMERICA
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300 400 500
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
Capitals of countries
Railroads
WILLIAMS ENGRAVING CO., N.Y.
Cochabamba
Arica
Sucre
Pisagua
Potosi
Iquique
BOLIVIA
Tocopilla
Oran
Jupia
Porto Tibirica
Antofagasta
Jujuy
Salta
Concepcion
PARAGUAY
Taltal
Luque
Asuncion
Villa Rica
Paranagua
Tucuman
Corrientes
Santiago del Estero
Iguassu Falls
Ijuhy
La Serena
Coquimbo
Uruguayana
Santa Maria
Porto Alegre
San Juan
Cordoba
Santa Fe
Parana
Salto
Relotas
Rio Grande do Sul
Vina del Mar
Valparaiso
Santiago
Mendoza
San Luis
Rio Cuarto
Rosario
URUGUAY
Jaguarao
San Nicolas
Mercedes
Villa Mercedes
Rufino
San Fernando
Curico
Buenos Aires
Montevideo
Talca
Chivilcoy
La Plata
Chillan
Talcahuano
Concepcion
Los Angeles
Santa Rosa
Dolores
C.San Antonio
C.Corrientes
Mar del Plata
Temuco
Neuquen
Bahia Blanca
Zapala
Valdivia
Puerto San Antonio
Puerto Montt
San Matias Gulf
Ancud
Castro
CHILOE I.
Gulf of St.George
C.Blanco
Puerto Deseado
Lake Argentino
Stanley
FALKLAND ISLANDS (British)
Strait of Magellan
Punta Arenas
TIERRA DEL FUEGO
Ushuaia
STATEN I.
Cape Horn
PACIFIC OCEAN
ATLANTIC OCEAN
Longitude 80° West from Greenwich 40°

Fig. 275

Andean countries. Recall their mineral products. Silver is obtained in the central and northern portions of the country, Antofagasta being the port for the output of some of the most productive silver mines. Coal is mined near Concepcion and at some other places, and copper and gold are produced in large quantities. There are also large deposits of iron ore. But the exception just mentioned is more important than all the other minerals combined: we refer to the immense deposits of nitrate of soda, which are in demand throughout the civilized world for fertilizing the soil.

Extent of mining

© Publishers' Photo Service

Fig. 276. — Sacking nitrate in the Atacama Desert

The nitrate beds are found in northern Chile twenty to forty miles inland, and extend through the Atacama Desert about 300 miles southward from the vicinity of Iquique. The railroad that parallels the coast (Fig. 275) indicates their location. Scarcely a drop of rain falls here from one year to the next; consequently no food plants for man are grown, nor are there any materials for houses. A more desolate region could hardly be imagined. Yet the want of rain has proved a great blessing, for the nitrate which makes this area one of the most important sources of Chile's wealth might otherwise have been washed away.

The nitrate exists in the form of rock found either on the surface or a few feet underground. It is blasted out by dynamite; the pieces are then crushed by machinery into a powder, which is boiled until the nitrate is dissolved and separated from other materials. This liquid is then evaporated until nothing is left but crystals that look much like ordinary salt. This is the nitrate, which is packed into sacks or thrown into piles for shipment abroad. A few years ago England and Germany imported much more of it than we did; we did not realize our need. But we now see the importance of fertilization, and our imports are sure to increase.

Why Argentina is often called the United States of South America. — Argentina is often called the United States of South America. It is the largest, the most populous, and the wealthiest of the South American countries that were settled by the Spanish. Brazil is far greater in area and population, but it is Portuguese rather than Spanish in origin. Argentina lies in the same temperature belts as the United States. What are they (Figs. 12 and 254)? Being therefore suited to occupation by a white population, and facing the Atlantic, it has enjoyed a

stronger tide of immigration from Europe than any of its neighbors. Among the recent European settlers the Italians are most numerous, though many of them return to Italy after each harvest is over. They form about one seventh of the population, and at one time came near making Italian the leading language; but Spanish has held its own in spite of them. The inhabitants are nearly all white, the number of Indians and people of mixed blood being very much smaller than in the other South American countries. This large proportion of whites is due to the fact that the vast extent of grassland (pampas) supported only a sparse native population, which was easily displaced by the early Spanish invaders. The people, therefore, are better educated than many of their neighbors, and are noted for their energy, thrift, and progressiveness. Yet even in Argentina education is by no means general, for about one half of the adult population can neither read nor write.

The similarity of Argentina and Uruguay to the part of the United States east of the Rocky Mountains. — Just as Chile has many points of similarity to our Pacific States, so Argentina and Uruguay resemble the portion of our country east of the Rocky Mountains. Since their combined area is only a little more than one third the area of the United States, this region is only about as large as the region between the Rocky Mountains and the Mississippi River. There is not such an extensive plateau east of the Andes as there is just east of the Rockies, nor are there any highlands corresponding to the Appalachian system.

In surface features

Nevertheless, any one traveling from Santiago to Buenos Aires would be struck with the similarity of the Argentine plains to our West North Central States (Fig. 20). Along the eastern border of the Andes is a plateau about 200 miles wide, broken on its west border by spurs from the mountains. This corresponds to our Great Plains, though it is of course much narrower. This plateau slopes rapidly eastward and merges into a low plain. Then, for the remaining 500 miles or more, except for the Sierra de Cordoba, one sees scarcely a hill or a ridge or a tree. The soil, also, is rich and deep, as in our North Central States. Similar conditions hold in regard to the land north and south of the Trans-Andean Railway for hundreds of miles. The region is an enormously large reproduction of the flat Dakota wheat country. This is the famous pampas region of Argentina.

In climate

Fig. 255 indicates a striking similarity of rainfall to that east of the Rocky Mountains. Just east of the mountains there is an extensive area where the fall is under ten inches. This gradually increases, however, toward the north and east until the amount at Rosario is forty inches and at Buenos Aires about thirty-five. How does this compare with the rainfall eastward from the Rocky Mountains (Fig. 18)?

The reasons for the variation are the same in the two cases. In Fig. 242 note the section under the influence of the westerlies, and explain why the strip of land just east of the Andes receives so little moisture. Also, by observing the direction of the winds in the part of northern Argentina next to the mountains, explain the slight rainfall. What reasons do you see for the much greater rainfall to the east and north?

There is, however, one important difference in climate. Buenos Aires, which is not far from the middle of Argentina in a north

and south direction, is in the same latitude as Memphis. But Argentina extends considerably farther toward the equator than the United States, even including Florida; it also extends farther toward the pole. Estimate how much nearer it comes to the equator and the pole than the section of our country which most closely corresponds to it. What advantage over us, if any, do you see for Argentina in this difference?

Fig. 277

Fig. 278

The heart of Argentina is the *pampas* or grassland which reaches as far south as the Colorado River, west to the arid section, and northward to about the thirtieth parallel. Observe how that area compares in agricultural products with our West North Central States.

In farm products

The most important crop is wheat, and the next is corn. The latter, as shown in Fig. 277, is grown near the eastern edge of the plain, where the rainfall is thirty inches or more. The farms are smaller there than in other parts of Argentina and Uruguay and the cultivation is more intensive. Although much less corn is raised than in our country, far more is exported because so little is consumed at home. Little is grown east of the Plata River in Uruguay because the land there is too swampy.

Fig. 279

Fig. 280

From The Geography of the World's Agriculture

Notice that, as in the United States, the corn and wheat areas are more limited than the areas adapted to grazing; notice also that sheep thrive under a greater variety of conditions than cattle.

Wheat is grown chiefly west of the corn area (Fig. 278), little being grown in Uruguay because the land there is used so largely for grazing. How does this location of the wheat belt in the southern hemisphere correspond to its location in North America? In North America wheat is grown much farther north than corn. Why, then, is it not grown farther south in the southern hemisphere? The fact that wheat lands in Canada have been taken up only recently may suggest an explanation. As in the case of corn, a great portion of the wheat is exported. This region also produces far more flax for seed than the United States, and a very large amount of alfalfa.

As in the United States, live stock is raised in large numbers where grass and

grain, particularly corn, are abundant. What kinds of live stock were found to be most abundant in the North Central States (p. 71)? Swine are not raised in great numbers in Argentina or Uruguay, but Fig. 279 shows how numerous are the cattle, especially in Uruguay. While Argentina is only one third as large as the United States and has less than one tenth the population, it raises about one half as many cattle.

In number of sheep Argentina nearly equals our country. Fig. 280 shows that although they are widely distributed, the greatest number is found within the area near Buenos Aires. Note also the extent to which they are raised in Uruguay. The reason for so many in the distant land of Tierra del Fuego is that the Andes are so low there that they permit the westerlies to carry considerable moisture to their eastern slopes, thus affording good pasture.

From all these facts it is plain that the area about Buenos Aires, including Uruguay, approaches our North Central States in importance as a granary and meat center.

© *Publishers' Photo Service*

Fig. 281. — The capitol building in Buenos Aires

The republics of South America adopted our form of government after winning their independence from Spain between about 1810 and 1830. What building in Washington, D. C., does this resemble?

Advantages of this region for transportation. — These agricultural industries could never have been developed as they have been on the pampas without excellent means for transportation. The Plata River and its tributaries correspond to the Mississippi and its tributaries in their contribution to the early development of this section; that river, in fact, has nearly as many miles of navigable waters as the Mississippi. Trace its principal tributaries and note their importance for the development of Uruguay and Paraguay, as well as Argentina. Find how nearly the Plata Basin equals the Mississippi Basin in extent (p. 488).

Its dependence upon river transportation

The dependence of this region upon its rivers is suggested by the fact that many of the large cities are located upon them. The greatest is Buenos Aires, on the estuary of the Plata River, the eleventh city of the world in size, often compared with Paris on account of its magnificence. While New York City contains about one nineteenth of our population, Buenos Aires contains more than one fifth of the inhabitants of Argentina. It is, therefore, even more than the New York of that country; while Rosario, 190 miles distant up the Parana River and

more nearly in the center of the grain and stock region, might be called its Chicago. Other cities in this region that owe their growth to the influence of the pampas are La Plata, Santa Fé, and Bahía Blanca; so also does Cordoba on the western border of the pampas. Montevideo is to Uruguay what Buenos Aires is to Argentina. About what proportion does it contain of the entire population of that country? It is thus evident that the inhabitants of temperate South America live in the cities more than do those of the United States. Yet these are not manufacturing countries, as we shall see later.

© E. M. Newman

Fig. 282. — The university at Montevideo

In Brazil, Uruguay, Argentina, and Chile public education is liberally provided for. This large university is in every way the equal of many of the universities in the United States.

While a great part of the fertile region lacks navigable rivers, its level surface has made railroad construction as easy as on our central plains. That fact, coupled with the unusual energy and intelligence of the people, has led to extensive construction of railways. Fig. 275 indicates a mileage nearly equal to that of all the other countries of South America combined. With how many other countries is Argentina connected by rail?

Its network of railroads

Since the export of food products is one of the chief interests of Argentina, these advantages for transportation are of great importance. Because it has sent its foods to Europe in competition with our own shipments, it is interesting to consider one great advantage that it has enjoyed over us. Its principal grain and live stock areas are near the coast, while ours are deep in the interior of our continent. Such products can, therefore, reach ship by a much shorter haul than with us. On the other hand, what can you say about the length of the voyage to Europe compared with that from New York? Who has the advantage there?

Advantages and disadvantages for foreign trade

Prospects for the growth of Argentina. — What is the prospect for the growth of Argentina? It has a very sparse population and is, no doubt, only in the beginning of its development. A very small part of the land that is suitable for farming is now under cultivation. The area given to wheat could probably be trebled; and improvements in the method of its cultivation could probably increase the present yield of eight to twelve bushels per acre from three to five times.

Its agricultural possibilities

From one third to two fifths of the area of Argentina is semi-desert, but irrigation from the mountain streams and dry farming can both be carried much further than at present. The possibilities in the arid region are suggested by the wonderful development

of the grape industry about Mendoza, the chief Andean city of Argentina, where the rainfall is only six inches per year.

The warm northern portion also has great possibilities for agriculture. Tucuman has long been a noted center for the production of sugar cane by irrigation, and other tropical and semi-tropical products can flourish in that vicinity. In other sections of the north where there is no forest and rain is abundant, rice and cotton and sugar cane can be cultivated. In Paraguay, near by, oranges are extensively grown; also Paraguay tea, which is very popular in the countries of South America.

Its forest resources

Northern Argentina, moreover, has extensive forests that are proving of great value. The most important tree is the *quebracho*, a name that means *break-axe* and that was given on account of the hardness of its wood. It is especially useful for railroad ties and fence posts, and when cut up into small pieces and boiled in water produces a compound valuable for tanning leather. Lumbering in this region is likely to increase greatly in the near future, and the clearing of the forests will make way for more farming and grazing.

Why Argentina is not likely to become an important competitor of the United States. — With such promise for the future, what is the prospect that Argentina will become an important competitor of the United States? There is little prospect, so long as the conditions for manufacturing are as unfavorable as at present. The Andean section is the only one from which minerals can be expected, and thus far there has been little mining. Moderate amounts of gold, silver, copper, lead, coal, and petroleum have been obtained. The deposits of precious metals throughout the Andean region are known to be large, but the want of extensive deposits of iron ore and coal prevents the extensive development of the iron industry. Such manufacturing as is done, therefore, must be of the kind that meets local wants, or that is concerned with the first stages in the preparation of raw materials for the market. For example, dairying is becoming prominent; flour mills are numerous; and sugar and wine are produced. The principal products for export are those connected with cattle and sheep; as, for example, fresh meat, dried beef, hides, tallow, and wool. Since we have become an industrial nation, these are all things that we are more likely to want to buy than to sell. There is, therefore, no likelihood of any keen competition between Argentina and the United States.

© *Publishers' Photo Service*

Fig. 283. — A flock of sheep in the southern part of Chile

The close relation between temperate South America and the United States.— While Chile, Argentina, and Uruguay are so much like the United States, we are likely to be close friends rather than rivals in the future. As our population increases we shall need most of the products that these countries can spare.

Our need of their products

Modern inventions have greatly aided this close relation. Formerly only wool and the hides of cattle and sheep, used for leather, could reach us. The meat had to be thrown away, because it spoiled on the voyage. But since the invention of refrigerator compartments in ships and refrigerator cars, this enormous waste has been avoided, and beef and mutton from Argentina and Uruguay now reach our cities in good condition. The fact that the wheat of Argentina is harvested during our winter may steady the price of flour for us, which is itself an important benefit.

Our need of nitrate from Chile for fertilizing the soil has already been mentioned. That country, also, has summer during our winter and is now so close to us, owing to the Panama Canal, that her fresh fruits and vegetables may be brought to us during our coldest weather in perfectly fresh condition. For many reasons, therefore, we are likely to be a good customer for this portion of South America.

On the other hand, they need our products as much as we need theirs. All new countries have to rely upon older ones for capital to develop many of their industries. Expensive irrigation projects, for example, must be financed. Railroad construction must be undertaken on a large scale, and in the near future many locomotives, rails, cars, and other railway materials must be imported. These countries are now using great quantities of our farm machinery, particularly Argentina, but still greater quantities must soon be called for. Even if they had an abundance of coal and iron, they would have to import many manufactured goods until factories of their own were established. But since they have not, they are especially dependent upon other countries for machinery, textiles, furniture, and other manufactured articles of all descriptions.

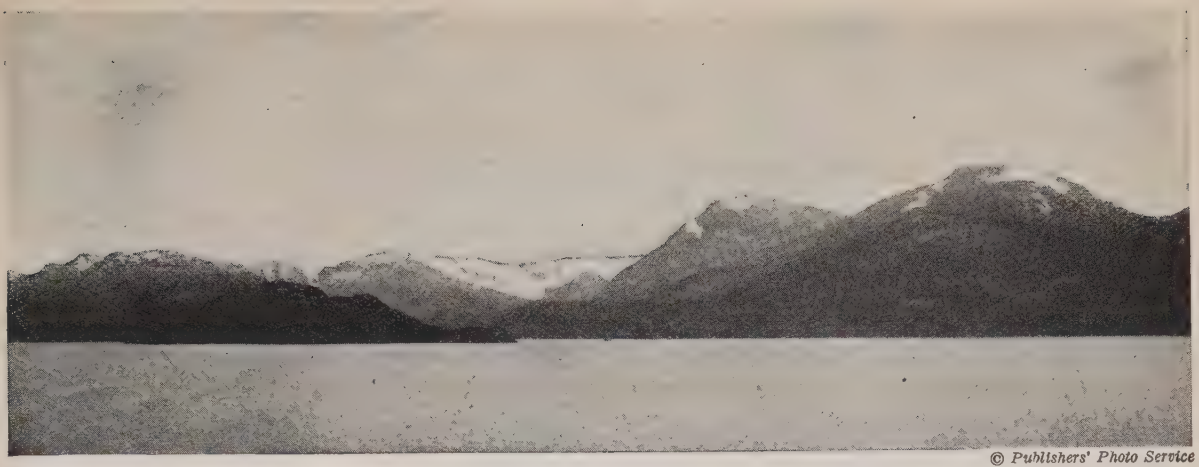
Their need of our products and capital

The United States is the wealthiest nation in the world, and also the greatest in manufacturing. We are in a good position, therefore, to supply capital for new undertakings. Since the leading countries of Europe have been so impoverished by the World War, our advantage in wealth is very great. Our enormous manufactures enable us likewise to supply railroad material, farm implements, textiles, and other articles almost without limit.

Why the United States ought to be their best customer

Until recently our trade with South America has been considerably less than that of some European powers. This was largely our own fault. We failed to learn their language, to study their needs, to adapt our goods and requirements to their desires and customs, and to send trained business men to represent us and to get their trade. We see our folly now, and the Panama Canal and the World War have given us a great advantage. Under these conditions we can expect to lead the world in trade with this region. Indeed, since the war it has already greatly increased.

An important step toward closer friendship with South America. — Important attempts, aside from trade, have been made to establish closer friendship among the republics



© *Publishers' Photo Service*

Fig. 284. — Mountains bordering the Strait of Magellan

Locate this strait on Fig. 275. It is about 350 miles long and from ten to fifty miles wide. It is difficult to navigate because of fogs, strong currents, and reefs.

of the New World. There are twenty-one of these in all, including those of North and South America and of the West Indies. See if you can make a complete list of them. Largely under the influence of the United States, a union of these has been brought about, called the Pan-American Union. (*Pan* is a Greek word meaning *all.*)

Many years ago when these republics were much weaker than now, the United States declared that the nations of the Old World should not be allowed to establish new colonies in America or to oppress any of the nations here. This declaration has been known as the Monroe Doctrine because it was made during the administration of President Monroe. It has helped to protect these nations against foreign powers.

The Pan-American Union aims to distribute the responsibility for such protection more equally among the American republics. It aims, also, to cultivate a closer acquaintance and friendship among them, and thus to promote peace in the New World. Its headquarters are at Washington, D. C.

Facts to be especially well fixed. — 1. Where the equator crosses South America. 2. The temperature regions from north to south. 3. The distribution of rainfall. 4. The distribution of different types of vegetation. 5. Location of the following cities: Buenos Aires; Rio de Janeiro; Santiago; Montevideo; Bogota; Quito; Valparaiso; Guayaquil; La Plata; Rosario; Mendoza. 6. Where coffee is obtained; rubber; cocoa; Panama hats; grain; meat. 7. The outline of South America. 8. Location of the three great rivers and of the Andes Mountains. 9. The three leading countries of South America.

Comparisons with North America. — 1. Describe the effects of the trade winds on each continent (Fig. 242 and pp. 191 and 262). 2. Of the prevailing westerlies (Fig. 242 and pp. 130 and 271). 3. Locate the arid sections in each continent and give the reasons for lack of rain (Figs. 13 and 255). 4. Point out the rainiest section in each, and state the causes. 5. Into what ocean do the principal rivers of each continent flow? 6. Make a list of important farm products common to the United States and South America. 7. Name several agricultural products that are extensively raised in one and not in the other. 8. Make as complete a list as possible of the agricultural and mineral products in which North America excels South America; in which South America excels North America.

Problems for independent study. — 1. The Pilgrim Fathers seriously considered settling on the coast of Guiana rather than that of New England. What do you think about the wisdom of their choice? Allen, N. B.: *Geographical and Industrial Studies: South America*, pp. 62–75 (Ginn); Chamberlain, J. F. and A. H.: *South America*, pp. 162–173 (Macmillan); Smith, J. R.: *Commerce and Industry*, pp. 326–327 (Henry Holt); Bowman, I.: *South America*, Chapter XVII (Rand McNally). 2. If you were emigrating to South America, where would you prefer to settle? 3. Chile and Texas resemble each other fairly closely in area and population. Which has the better prospects for further growth? Plan a debate with some one on this question. Allen, N. B.: *Geographical and Industrial Studies: South America*, p. 245; Bowman, I.: *South America*, Chapters V, VI; Chamberlain, J. F. and A. H.: *South America*, pp. 69–88. 4. The Plata Basin is nearly as large as the Mississippi Basin. Will it ever equal the Mississippi Basin in importance? Allen, N. B.: *Geographical and Industrial Studies: South America*, pp. 145–146, 185–190; Bowman, I.: *South America*, Chapter IV; Carpenter, F. G.: *South America* (1921), pp. 241–254 (American Book); Smith, J. R.: *Commerce and Industry*, p. 342. 5. Is the location of the mouth of the Plata more or less favorable to commerce than that of the Mississippi? Consult references given under Question 4, above. 6. Make a list of products of South America that you have often seen. 7. Find out some of the plans of the Pan-American Union for promoting friendship among the twenty-one republics of the New World. 8. Estimate how much distance is saved by going from New York or New Orleans to Guayaquil via the Panama Canal rather than via Cape Horn or the Strait of Magellan. 9. Learn more about nitrate of soda shipped from Chile. National Geographic Magazine, 1922, vol. 42, pp. 221–223; World Book, vol. 2, p. 1332. Allen, N. B.: *Geographical and Industrial Studies: South America*. 10. Make a drawing of the Plata River system and locate the chief cities upon it. 11. Compare Argentina with Canada in wheat production and export. Consult *World Almanac; The Statesman's Year-Book* (Macmillan). 12. Good highways are sadly lacking in Argentina, as in many parts of the United States. Write a composition showing how better roads would benefit that country. 13. Watch the newspapers for articles or news items on South America. 14. Write to the United States Rubber Co., 1790 Broadway, New York City, for its booklet, *Rubber, a Wonder Story;* or to the Goodrich Rubber Co., Akron, Ohio, for its booklet, *The Romance of Rubber*. 15. The South Americans are very proud of Rio de Janeiro. Why? Allen, N. B.: *Geographical and Industrial Studies: South America;* Bowman, I.: *South America;* National Geographic Magazine, September, 1920, vol. 38; Browne, E. A.: *Peeps at Many Lands: South America*, pp. 45–47. 16. Why has rubber from the Far East become more important than Brazilian rubber? See pp. 427–428.

PART IV. EUROPE

I. General Facts

Likeness in the early history of the continents of Europe and North America. — The growth of the continent of Europe, as of North America, has required millions of years. Long ages ago mountains appeared above the sea in several places, at first in the northwestern portion of the continent. Although greatly worn away, these mountains may still be seen in Finland, Scandinavia, and Scotland (Fig. 286), as well as in Germany, Belgium, and other sections. They resemble the old, worn-down mountains of the Appalachian and Laurentian highlands.

Comparison in arrangement of mountains and plains

© Keystone View Co., Inc.

Fig. 285. — Flying across the Alps

Other mountain ranges were formed in southern Europe, but, like those of western America, they are younger and far less worn away than the older mountains just mentioned. The most prominent of these are the Pyrenees, the Alps, and the Caucasus. Locate these three systems in Fig. 286. They are the highest in Europe, the Caucasus being the loftiest of all and the Alps ranking next. There are many other mountains in southern Europe in addition to these ranges, as can be seen in Fig. 286; while they vary in distribution, most of them extend roughly east and west.

Between the mountains of the northwest and of the south there is an extensive lowland plain (Fig. 286). A part of this has been lowered beneath the sea by the sinking of the land, thus forming the shallow Baltic Sea. This plain extends from southern England through Belgium and Holland, or the

---

Questions on Fig. 286. — 1. How does the proportion of lowlands in Europe differ from that in North or South America? 2. What indications do you see of good fishing grounds off the northwestern coast? 3. What so-called mountains, highlands, and plateau are less than 1,000 feet in elevation? 4. By comparing this map with Fig. 287, see which countries in Europe are chiefly highland, and which chiefly lowland, countries.

EUROPE
PHYSICAL MAP
Scale of statute miles
0 100 200 300 400 500
ICELAND
Mt. Hekla 5,110 ft.
ARCTIC OCEAN
Arctic Circle
North Cape
NOVA ZEMBLA
Kara Strait
KOLGUEV I.
VAIGACH I.
Tundras
Pechora R.
Ural Mts.
Ob R.
ASIA
LOFOTEN ISLANDS
West Fiord
SCANDINAVIAN HIGHLANDS
MURMAN COAST
KOLA PENINSULA
White Sea
FAROE ISLANDS
SHETLAND ISLANDS
ORKNEY ISLANDS
HEBRIDES OR WESTERN ISLANDS
SCANDINAVIAN PENINSULA
GULF OF BOTHNIA
FINLAND
UPLAND
LAKE REGION
Lake Onega
Lake Ladoga
ARCTIC PLAINS
Dvina R.
Gulf of Finland
Lake Peipus
Gulf of Riga
VALDAI PLATEAU
GREAT RUSSIAN PLAIN
Volga R.
Kama R.
URAL MOUNTAINS
SCOTTISH HIGHLANDS
BRITISH ISLES
Irish Sea
ATLANTIC OCEAN
NORTH SEA
BALTIC SEA
Vistula R.
Oder R.
Elbe R.
Rhine R.
Dniester R.
Dnieper R.
Don R.
Oka R.
Marshes of Pripet
Pripet R.
C. Clear
St. George's Channel
Lands End
English Channel
Strait of Dover
Skagerrack
Kattegat
DANISH PENINSULA
Weiser R.
L. Wetter
BAY OF BISCAY
C. Finisterre
PARIS BASIN
Loire R.
ERZ MTS.
CENTRAL HIGHLANDS
VOSGES MTS.
BLACK FOREST
BOHEMIAN FOREST
Danube R.
CARPATHIAN MTS.
Caspian Steppe
Manych Depression
Sea of Azof
CRIMEA
CAUCASUS MTS.
Mt. Elbruz 18,526 ft.
Mt. Kazbek 16,545 ft.
CASPIAN SEA
85 feet below sea level
CANTABRIAN MTS.
PYRENEES MTS.
Mt. Blanc
TYROL ALPS
CENTRAL PLATEAU
CEVENNES MTS.
Rhone R.
Saone R.
Garonne R.
IBERIAN PENINSULA
Douro R.
Tagus R.
Guadiana R.
SIERRA MORENA
SIERRA NEVADA
St. Vincent
Strait of Gibraltar
LOMBARDY PLAIN
Po R.
HUNGARIAN PLAIN
TRANSYLVANIA PLATEAU
TRANSYLVANIAN ALPS
WALLACHIAN PLAIN
Danube R.
BALKAN MTS.
BALKAN PENINSULA
Bug R.
Dniester R.
Pruth R.
Sea of Azof
BLACK SEA
Bosporus
Dardanelles
Sea of Marmora
Aras R.
BALEARIC ISLES
CORSICA
SARDINIA
ITALIAN PENINSULA
Mt. Vesuvius 4,360 ft.
APENNINE MTS.
ADRIATIC SEA
DINARIC ALPS
Strait of Otranto
Strait of Messina
SICILY
Mt. Etna 10,756 ft.
IONIAN ISLANDS
MOREA PENINSULA
PINDUS MTS.
Aegean Sea
RHODES
CRETE
CYPRUS
MALTA
MEDITERRANEAN SEA
AFRICA
ASIA MINOR
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
DEPTHS IN FEET
Sea level to 600
Below 600
WILLIAMS ENGRAVING CO., N.Y.
1029
10° Longitude West 0° Longitude East 10° from Greenwich 20° 30° 40° 50°

Fig. 287

1. Ingushetia; 2. Kabardin-Balkaria; 3. Karatchay-Tcherkess; 4. North Ossetia; 5. Tcherkess; 6. Tchetchen.

Questions on Fig. 287. — 1. Compare the number of separate countries in Europe with that in North America; in South America. 2. To compare the present boundaries of European countries with those before the World War, consult Fig. 331. 3. Compare the number of large cities between the 50th and 60th parallels with the number in North America. 4. Compare with Fig. 286 to determine which political boundaries in Europe appear to you to be natural, *i.e.* following mountain ranges, rivers, or coast lines.

"Low Countries," entirely across Germany and Russia. It broadens toward the east until it includes almost all of Russia. Estimate its length from east to west. About two thirds of Europe is included in this plain.

Thus in both continents there is an old and low mountain region on one side and a more recent and much higher one on the other, with a vast plain between. What difference do you see in the general direction in which the principal mountain systems and plains of the two continents extend?

While the mountains and plains were being formed, coal beds were also accumulating, as in America, during the Coal Period. State once more how coal was formed (p. 4).

Comparison of the Coal Period and Ice Age in North America and Europe

Fig. 288 shows the parts of Europe in which coal beds occur. In what countries are they found? Most of the coal is bituminous, though anthracite is also found. In a number of sections lignite (p. 6) is common, and peat is also abundant in the marshes of western and northern Europe (Fig. 296). Recall how peat has been formed (p. 6).

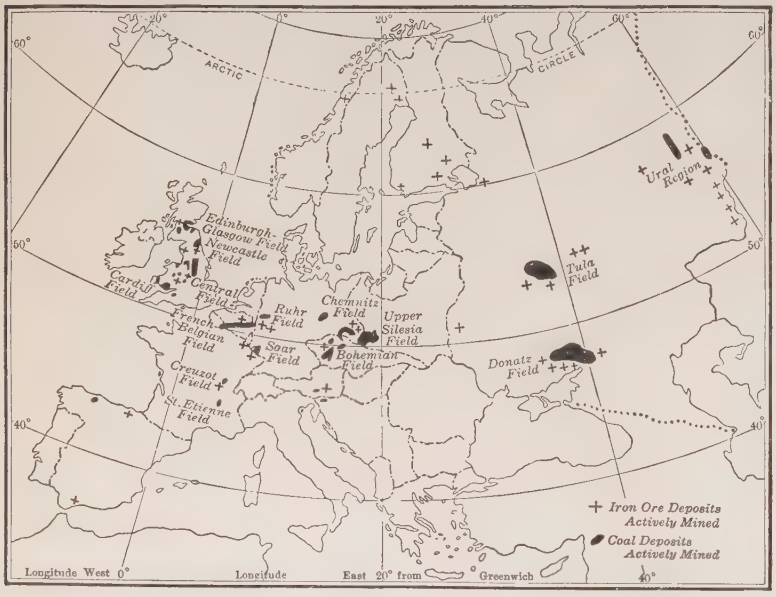


Fig. 288. — Coal and iron ore deposits actively mined in Europe

During the period when eastern North America was invaded by the Great Ice Sheet from the north, snow gathered on the highlands of northwestern Europe and spread outward in all directions. Fig. 289 shows the extent of the European ice sheet. It wrought changes in Europe similar to those in our country. State some of these changes.

The different effects on the two continents of the rising and sinking of the coasts

While the coast line of each continent has undergone many changes, there is a marked difference in their effects in the two cases.

The irregular coast of northwestern Europe, like that of northeastern North America, is due to the sinking of the land. The Baltic Sea and its gulfs, as we have seen, are lowlands sunk beneath the sea; and the hills of this sunken land form islands, peninsulas, or shallow banks where fish abound.

During the growth of the mountains of southern Europe, the rising and sinking of small areas of land have made many penin-

sulas, with bays, gulfs, islands, and seas between. The Mediterranean Sea occupies a basin, thousands of feet in depth, formed by the sinking of this part of the earth's crust. As a result of all these movements, Europe has a much more irregular coast line than North America; in fact, its coast is much more irregular than that of any other continent. Name and locate the larger peninsulas and the gulfs and seas that border them (Fig. 286).

Difference between Europe and North America in area and population. — By referring to the Appendix, find how small Europe is in comparison with North America. Find, also, how many times as large its population is. These comparisons prepare one for appreciating the density of population as shown in Fig. 294. No one of our states approaches any one of several of the countries of Europe in number of inhabitants to the square mile. Which countries are the most crowded?

One fact about the location of this vast population raises some interesting questions. If you trace the fiftieth parallel of latitude on a globe or map of the world, you will observe that it crosses Canada a little to the north of our northern boundary, but that it runs entirely south of England, crosses France near Paris, and extends through southern Germany and Russia. From this it is seen that by far the larger part of Europe lies farther north than the United States and due east of Canada. Even the more densely populated portions of Europe are located farther north than our state of Maine. Leningrad is in the same latitude as the northern tip of Labrador, and even the southern parts of Spain, Italy, and Greece reach no farther south than the southern boundary of Virginia. The questions suggested are: How can so large a population flourish so far north? In particular, why is the most densely settled section so very far north as compared with eastern North America?

Fig. 289. — Areas in Europe that were covered with ice during the Great Ice Age

The lined area was covered by the Ice Sheet, the direction of movement of the ice being indicated by the direction of the lines. The dotted areas were covered by mountain glaciers.

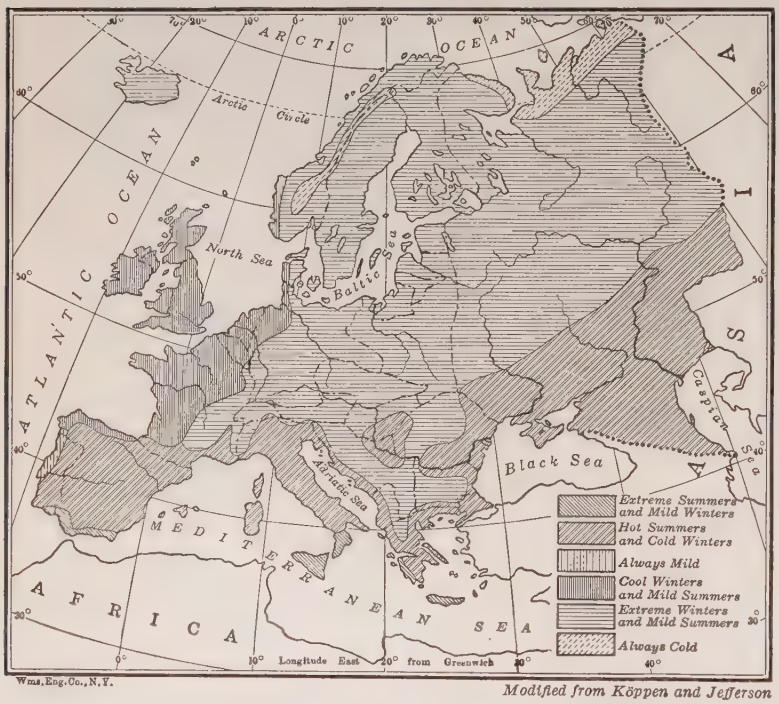
How so great a population can flourish so far north. — The prevailing winds, together with the arrangement of the mountains, furnish an important part of the explanation. As has been stated, the principal mountains and highlands are located in the northwest and in the south, leaving a vast plain between, stretching from the Atlantic Ocean to the eastern boundary of the conti-

The effect of the prevailing winds on the temperature

nent. Contrast this condition with that in North America.

The westerlies are the prevailing winds in northern Europe, as in the United States and Canada (p. 233). On their way to Europe they cross the warm Gulf Stream; in fact, they are the cause of this eastward movement of the ocean water. Fig. 250 shows how that stream widens as it leaves Florida, crosses the Atlantic in a northeasterly direction toward Europe, and, as the West Wind Drift, passes along a considerable portion of the western coast of that continent.

The westerlies, blowing from across these warm ocean waters, carry an enormous amount of heat to western Europe. This is especially evident in the winter. In the summer these moist winds tend to cool western Europe, so that the summers are mild. How does the area of *mild summers and cool winters* compare with that in North America? These west winds and the large area of lowlands near the western coast make it possible for crops to be raised nearer the pole in Europe than in any other part of the globe. Fig. 242 shows how the heat is carried north by these winds. Would you expect the winds to have a more or less moderating effect as they move farther eastward from the ocean? How do the boundaries of the temperature regions illustrate this fact?



Modified from Köppen and Jefferson

Fig. 290. — The temperature regions of Europe

In what temperature region is most of Europe? Why is the area of mild summers and cool winters much larger in Europe than in North America? What countries have hot summers and cold winters? The temperatures of this region in Europe have no such extremes as the United States. Can you tell why? What portion of Europe resembles the Gulf Coastal Plain of the United States in its temperatures?

These winds carry an enormous quantity of moisture as well as heat. **Their effect on the rainfall** The arrangement of the mountains has a great influence on the way in which this is distributed over the land as rain.

In North America, where high mountains extend north and south along the entire western side of the continent, the warm, damp air soon loses most of its moisture as it moves eastward (p. 131). What causes this? In Europe, on the other hand, where the higher ranges extend nearly east and west, the mountains interfere much less with the movement of vapor to the interior. For that reason the west winds give up their moisture more gradually. Its distribution over a wide area is helped by the eastward movement of cyclonic storms, as in the United States. Thus there is no arid

land in the belt of westerlies all the way from Ireland to the Ural Mountains (Fig. 291). The arid region in southeastern Russia is not an exception, for this is hardly touched by the westerlies.

The effect of the ocean winds is naturally greatest near the coast, as in western North America. What temperature region is found to the east of that of *mild summers and cool winters?* How does its latitude compare with that of the corresponding belt in North America? Thus in eastern Russia there are not only great extremes of heat and cold, but there are often serious droughts as well.

The cyclonic storms cannot bring rain to eastern Europe as they do to eastern North America. To be sure, they cross the ocean from North America and continue across Europe (p. 239), causing variable winds as in the eastern part of the United States and Canada. But they cannot bring rain to eastern Europe as they do to those regions, because there is no ocean just to the east of them to supply the vapor. Can you see why the rainfall is so light to the north and west of the Caspian Sea?

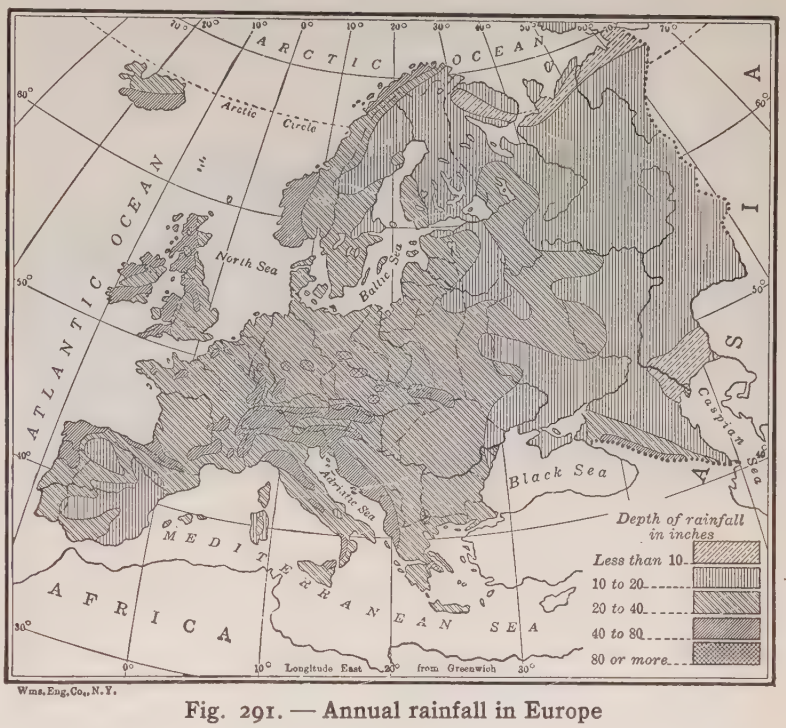


Fig. 291. — Annual rainfall in Europe

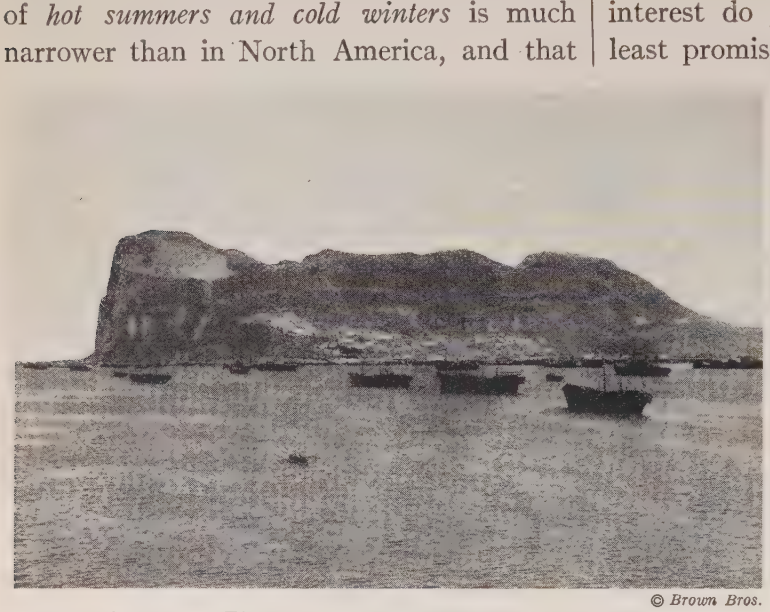
Why does the western half of Europe receive more rainfall than the eastern half? Why does Norway have much more rainfall than Sweden? The western part of Ireland than the eastern? The western part of Great Britain than the eastern? The western part of the Iberian Peninsula than the eastern?

Why southern Europe is not so densely populated as the countries farther north.—It might still seem that the more densely settled portions of the continent would be in the south, especially when one considers the mildness of the temperatures there.

There are two reasons for these moderate temperatures. In the first place, the east and west direction of most of the lofty mountains exerts a great influence on the climate of the countries that lie both to the north and to the south of them. Rising like great walls, these mountains prevent south winds from bearing northward the heat of the Mediterranean Basin; and they also interfere with the passage of cold north winds. Northern Florida, much farther south than southern Europe, is sometimes visited by cold waves and frosts; but such winds rarely reach portions of southern Europe that are protected by the mountains.

Secondly, the Mediterranean Sea also greatly affects the climate of the countries that border upon it. How does it compare in area with Lake Superior? It will be remembered that our Great Lakes and the At-

lantic Ocean produce a distinct effect on the climate of the neighboring land, moderating the heat of summer and the cold of winter (p. 56). It is partly because of the influence of the Mediterranean that the belt of *hot summers and cold winters* is much narrower than in North America, and that southern Italy, Greece, France, and Spain have such an equable climate.



© *Brown Bros.*

Fig. 292. — The entrance to the Mediterranean Sea

Gibraltar, as shown on Fig. 385, is on the north side of the strait of the same name. From one end of the Mediterranean to the other, the shore is rugged and often mountainous. How is this indicated by Fig. 385?

Yet there are factors that have greatly checked population in this section. One is its mountainous character; another is the lack of coal (Fig. 288). Can you explain how both facts hinder population? Probably the most important reason, however, is that southern Europe, like southern California, is not reached by the westerlies in summer, for it then lies within the belt of the horse latitudes (p. 233). This accounts for the fact that southern Spain, Italy, and Greece receive very little rain in summer.

The effect of the temperature and rainfall upon the vegetation of Europe. — Europe, unlike any other continent, has not one square mile of real desert. Yet the temperature, rainfall, and surface vary greatly and the vegetation must vary likewise. Fig. 293 shows the kinds of vegetation that flourish in the different sections. What facts of interest do you find in it? Which is the least promising portion of the continent for agriculture? Where are the principal forests? By comparing this figure with the population map (Fig. 294), find what types of natural vegetation flourish in areas where the population is most dense.

Conditions favoring use of the sea. — The hot, unhealthy coasts of Mexico and Central and tropical South America have always kept people from the sea. Most of the inhabitants of these countries, as we have seen, live far inland on the plateaus and hardly ever see the ocean. Western and southern Europe form a striking contrast to them in this respect. There the coast lands are especially attractive as homes for the people, and the peninsulas are so numerous that a large part of the inhabitants live near the salt water. Naturally, therefore, they have developed skill in handling vessels and have traveled widely. Most of the commerce of the world at all times has been carried on by European ships.

Nearness of the Europeans to water

Europe forms another contrast with South America and many other regions in its number of excellent harbors. In proportion to its area, Europe is better supplied with them than any other continent. Those on the west and south

Excellence of harbors

coasts have the additional advantage of being free from ice in winter.

Conditions favoring hard work. — The fact that Europe has a climate which favors hard work is another reason for the remarkable progress of that continent. In the tropics, as we have seen (p. 263), man is not inclined to great effort; and the white man cannot work hard there even if he will. In the regions where it is always cold, man can do little more than get enough to eat and wear, no matter how hard he works; there is too little reward there for even severe effort. In the regions with distinct winters and summers, however, in which most of Europe is located, man feels like working, and his labor brings high reward. The climate thus favors the fullest use of the many advantages that the continent offers. Nowhere else in the world, except perhaps in parts of the United States, are all the conditions so well suited to the growth of a strong and progressive race as in Europe, particularly its northwestern part.

Fig. 293. — The plant regions of Europe

What countries have coniferous forests? Most of Europe was once covered with broad-leaved temperate forests. Why are there only scattered groves of these forests left? How has man treated similar forests in our country? In what countries are there grasslands? How does the rainfall in the grasslands compare in amount with that in the broad leaved forests (Fig. 291)?

Reasons for so many independent countries. — Although Europe is so much smaller than either North or South America, it has almost as many independent countries as the entire New World including the West Indies. Count them (Fig. 287). Why are there so many? Why are not the people more closely bound together in a few great nations? One of the reasons is that so many parts of the continent are naturally cut off from all others. Spain, for example, is not only a peninsula, but is separated from France by the lofty Pyrenees Mountains. The British Isles are entirely cut off by water; Scandinavia nearly so; and Italy is bounded on the north by the Alps and on all other sides by water.

In earlier times people living in such isolated regions could not have many interests in common with those who were so separated from them. Thus many different customs, beliefs, and languages have arisen; and because of these, many separate nations

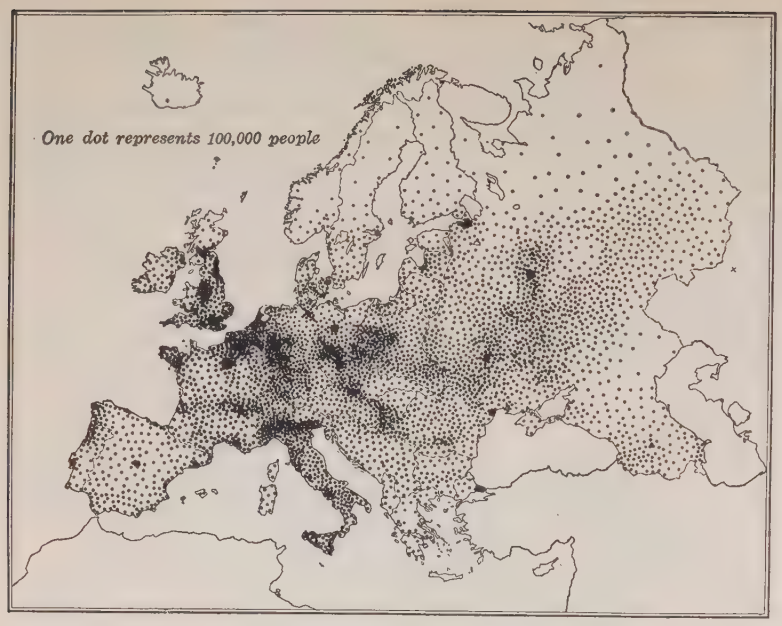


Fig. 294. — Distribution of population in Europe

have come into existence. The number has recently been increased as a result of the World War; the reason for this will appear later (p. 381).

Facts to be especially well fixed. — 1. Location and names of the principal mountain systems. 2. Location of the principal plains. 3. Names and location of the larger peninsulas. 4. Of the larger bays and seas. 5. The latitude of Europe compared with that of the United States. 6. Leading facts regarding prevailing winds and rainfall.

Problems for independent study. — 1. How would the conditions affecting life be changed if the mountains of Europe extended north and south near the western coast? 2. What would be some of the results if the land were to rise at Gibraltar, making the Mediterranean a closed sea? 3. Near what parallel of latitude are Madrid, Naples, and Constantinople located? What large cities in the United States are in about the same latitude? 4. New Orleans is about how many miles farther south than Naples? 5. What part of the United States is similar in temperature and rainfall to the British Isles? 6. If Iowa had the same density of population as Belgium, how many people would it contain? That would be how many times the present number? 7. What would be the population of the North Central States if they had the same density of population as France?

II. Northwestern Europe

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Belgium	Limited monarchy	11,800	7,744,000	Brussels	794,000
British Isles		121,800	47,363,000		
1. Great Britain	Limited monarchy	88,800	42,769,000		
England		50,900	35,681,000	London	4,485,000
Wales		7,500	2,206,000	Cardiff	226,000
Scotland		30,400	4,882,000	Glasgow	1,057,000
2. Irish Free State	British dominion	26,600	3,165,000	Dublin (Baile Átha Cliath)	438,000
3. Northern Ireland		6,100	1,279,000	Belfast	434,000
4. Other islands		300	150,000	Douglas	20,000
Denmark	Limited monarchy	16,600	3,420,000	Copenhagen	586,000
France	Republic	212,700	39,210,000	Paris	2,906,000
Germany	Republic	181,200	62,539,000	Berlin	3,931,000
Luxemburg	Limited monarchy	1,000	261,000	Luxembourg	48,000
The Netherlands	Limited monarchy	13,200	7,315,000	Amsterdam	712,000
Norway	Limited monarchy	125,000	2,650,000	Oslo	258,000
Sweden	Limited monarchy	173,000	6,036,000	Stockholm	439,000
Switzerland	Republic	16,000	3,918,000	Zurich	205,000

1. British Isles

The importance of the British Isles. — The two islands, Great Britain and Ireland, together with the several hundred small islands near their shores, have about the area of the state of New Mexico; yet they contain the largest city in the Old World, have more manufacturing and more foreign commerce than any other country except ours, and more ships and more colonies than any other nation. In fact, in the British Empire is included one fourth of the area and population of the earth.

Reasons for such importance. — What has given them such importance? One factor is their location. They stand at the gateway to the most productive parts of Europe. Count the countries that face these islands on the south and east, and name the rivers that furnish an outlet for those countries upon the North Sea. What great seaports are opposite London?

Advantage of location

© *Keystone View Co., Inc.*

Fig. 295. — An English village on the Isle of Wight

This island, in the English Channel, is famous for its pleasant climate. Can you see why? There are no large cities with their noise and dirt; many people spend their vacations here.

These islands are situated, also, directly between Europe and America. England lies on the busiest water route in the world, connecting all the North Sea ports with the western hemisphere.

The most important of all minerals is coal. Any country that lacks it suffers a most serious disadvantage, no matter what other advantages it may enjoy. Give an example of this fact from your study of South America (p. 251). Recall some of the results in our own country during strikes, when coal can be obtained only with difficulty.

Abundance of raw materials for manufacturing

1. The supply of fuel

Its abundance in Great Britain is shown in Fig. 288. Note how extensive the coal beds are northwest of a line drawn from Hull to Bristol. Locate the principal fields. Observe that both Glasgow and Edinburgh have coal near them. How near is Liverpool to coal? What other large cities are located near important coal deposits? How far is London from coal fields? This island produces more coal than any other country except the United States. Ireland is less fortunate, for it has very little coal. It has a partial substitute, however, in its peat (Fig. 296), which is used to a considerable extent; but coal is better, and is imported in large quantities from Great Britain.

The mineral next in importance to coal is iron, which is also abundant in Great Britain. Its location is exceptionally favorable, for

none of it is far from coal, and in some places the same shaft is used to bring coal and iron ore to the surface. Limestone, you will remember (p. 40), is needed, in addition to coal, to reduce the ore to iron; this is found near the other two. Thus Great Britain has the three minerals necessary to produce iron and all the things made from it.

2. Variety and location of other minerals

Tin is a fourth mineral. Even before the time of the Romans, ships from the Mediterranean came to southwestern England for that metal, which is still mined to some extent. Other mineral products of importance are building stone, slate, salt, and clays for pottery.

So much rain falls on the islands that grass flourishes better than many other farm products. On that account the raising of live stock has always been important. The cool climate favors the growth of a heavy fleece on sheep. More than 25,000,000 sheep are kept on the islands.

3. Raw materials for textiles

© *E. M. Newman*

Fig. 296. — Gathering peat in Ireland

Peat bogs occupy about one seventh of the whole area of Ireland. Many deposits are nearly fifty feet deep, so that operations resembling quarrying are required. By-products of peat are paper, yarn, and fertilizer.

Another valuable product is flax. It is grown principally in Ireland and is the material from which linen is manufactured. Wool and flax, together with the minerals mentioned, furnish the raw materials for very extensive manufacturing.

The mere presence of such materials, however, gives no guarantee that extensive manufacturing will result. Some countries have an abundance of raw materials which are little used. In addition to these, a climate is needed that favors hard work, and people are wanted who are intelligent, reliable, and skillful. Great Britain and Ireland (formerly referred to together as the *United Kingdom*) meet these requirements admirably. The coolness of the temperature (p. 284), with the change of seasons, gives the people unusual energy. They are intelligent, too, to an unusual degree. For example, many inventions are necessary in order to develop the machinery required for manufacturing, and the British have surpassed every other nation, except possibly our own country, in such discoveries. It was James Watt, a Scotchman, who invented the modern steam engine, and it was George Stephenson, an Englishman, who built the first locomotive. Nor is there any question about the reliability and skill of the British workmen.

Character of people

The raw products that have been mentioned indicate the principal kinds of manufacturing. The cities most noted for iron and steel goods are Glasgow in Scotland and

© Underwood and Underwood

Fig. 297. — Placing pottery in a kiln in Dresden, Germany

© Underwood and Underwood

Fig. 298. — Dipping plates into a glaze before baking at Worcester, England

Wedgwood china is the most famous grade of pottery manufactured in England. Germany produces the well-known Dresden china. Bavarian china is also widely used. But none of these brands is as beautiful and as pure as the French china made at Limoges and Sèvres. Look at the stamps on as many different sets of dishes as you can and try to find where they are made.

Birmingham and Sheffield in England. Locate them. Note how near they are to coal mines (Fig. 288). These cities and those near them convert great quantities of iron ore into iron and steel. Glasgow is the greatest center in the world for the building of steel ships; it also makes many locomotives and other heavy machines. Birmingham manufactures a variety of steel products, including steam engines, firearms, and automobiles. Sheffield has for centuries been noted for its cutlery, the presence of grindstone quarries in the vicinity being one reason for this. Steel of a special quality is imported from Sweden for the manufacture of some grades of Sheffield cutlery.

Extent of manufactures

1. Of iron and steel manufacturing, and the leading centers

The manufacture of iron and steel goods is so extensive that the British mines supply only a portion of the ore needed. A great deal is imported from Spain. Since a plentiful supply of coal is required for smelting, the greater part of the imported ore is brought to Cardiff in south Wales. Locate that city (Fig. 310).

The fact that sheep have long been raised in great numbers in Great Britain explains the beginning of the textile industry there. The number of workers in this industry has in times past been greatly increased by the arrival of many skilled workers from the continent of Europe, who fled from their native countries as a result of wars or misgovernment.

2. Of woolen manufacturing, and the leading centers

© *Underwood and Underwood*

Fig. 299. — Sheep grazing in the southern part of England

England has been producing wool for hundreds of years. The cool temperatures produce a thick fleece with long fiber. Can you see why?

In the hilly section of northern England, where both coal and wool are near at hand and where there is an abundance of water power, there are scores of woolen factories. The principal woolen center is Leeds, but there are many others. Bradford is noted for its broadcloth and worsted goods, and neighboring towns for yarn, hosiery, blankets, and carpets. This industry extends northward into Scotland and southward to Leicester, which has long been famous for its hosiery.

The woolen industry is now so highly developed that the native sheep, in spite of their great numbers, supply only about one sixth of the wool used in the factories. In what other country have you found a similar situation (p. 45)?

3. Of cotton manufacturing, and the leading centers

From the spinning and weaving of wool it was easy to turn to the manufacture of cotton, although the islands themselves cannot grow a pound of the raw material. Manchester, on the west side of the hilly region, near Liverpool, is the chief center of the industry. Name other cities near it. The dampness of the atmosphere was in the early days one of the points in favor of that section, for in dry air cotton is in danger of becoming too brittle for spinning and weaving. Now, however, any factory may have any degree of dampness that is desired, for the air within a modern cotton factory is made humid or dry by artificial means. It is from the west that most of the raw cotton for manufacture is obtained, for it comes mainly from our Southern States. Of our vast cotton crop we consume at home about 5,000,000 to 7,000,000 bales of 500 pounds each, while the British take about 4,000,000. The central portion of Great Britain—including in that area southern Scotland and the two sides of the hilly

© *Brown Bros.*

Fig. 300. — The Exchange, Manchester

This building, modeled partly after the temples of ancient Greece, is situated at the head of Market Street, and, on cotton-market days, is crowded with buyers and sellers from all parts of the cotton manufacturing district. Manchester is the center of the cotton trade.

region of northern England — is the seat of the most extensive textile industry in the world. What section of the United States most nearly equals it?

The third great textile industry is the making of linen, which is done chiefly in Ireland. Belfast is the linen center. On account of the lack of coal, most of this manufacturing takes place on the eastern coast, where fuel is easily obtained from Great Britain. At one point the two islands are only thirteen miles apart.

4. Leading center for linen manufacturing, and rank of the three textile industries

Of the three textile industries named, cotton manufacture is by far the most extensive; wool is second, and linen third. The great importance of all three is shown in the fact that 3,000,000 to 4,000,000 persons — men, women, and children — are directly dependent upon them for a livelihood. What part of the entire population is that number?

© *Underwood and Underwood*

Fig. 301. — Bleaching linen at Belfast, Ireland

After the linen is woven it is placed out in the sun to bleach. These men are taking the long strips of cloth back to the factory after they have been bleached. A linen mill is seen in the distance.

Fig. 495 shows what parts of the earth belong to the British Empire. They include one entire continent and at least one country in every other continent. Among these, the Irish Free State is nearest to Great Britain. The largest of all these is in North America. Name it. What small one is in South America? What do you observe about the number of islands that belong to the British (Fig. 215)? In what oceans are they located? Many of these possessions have only recently been occupied, and are therefore thinly settled. India, on the other hand, was thickly settled long before America was discovered by Columbus, and its present population is seven times that of the British Isles. There is no other nation that compares with Great Britain in the extent and importance of its world-wide domain.

Countries of the British Empire

1. Their number and importance

Its vast extent is largely due to the favorable location of the British, and to their courage, energy, and skill as sailors. No Englishman lives more than about seventy miles from the salt water, which explains why many have become sailors and fishermen. As a nation the British have always loved the water.

2. How they were obtained

Naturally, when America was discovered they became enthusiastic explorers. When wooden vessels were common, they had great forests to draw upon for their construction; and later, when iron took the place of wood, they found this material abundant also. In consequence, they have been active in build-

ing ships and in exploring every corner of the earth. Naturally, also, whenever they were the first comers in uncivilized lands they laid claim to them in the name of their mother country.

Review what you have already learned about the permanence of British colonies in North America (pp. 23–24). Wherever the British have gone they have taken a firm hold upon the land and made permanent homes by tilling the soil. New colonists have gone out from year to year to each settlement until it became strong and secure. Moreover, the British have in general kept the loyalty of their colonies through good government.

3. How they have been kept

Certain parts of the Empire, however, have not been as happy under British rule as Canada and Australia, where the population is chiefly British in its origin. India, like Egypt, whose inhabitants differ greatly from the British in race and customs and beliefs, has shown considerable unrest. For Egypt's discontent which resulted in its independence, see p. 455.

4. Attitude of British subjects toward the Empire

British rule had long been bitterly resented by a large proportion of the Irish, and beginning in 1916 a form of republican government was established in defiance to England. Until the summer of 1921, Ireland was in a state of open rebellion, which culminated in the establishment, by treaty with England, of the Irish Free State early in 1922. In securing its long-cherished desire for self-government, the Irish Free State gained the same rank and influence as Canada, Australia, and the other dominions of the British Empire. The six northern counties of Ireland were permitted to remain out of the Irish Free State with provision for their entrance if they should decide to become a part of it later. In the meantime these counties were given practically complete self-government without wholly giving up representation in the English Parliament. In this way they have become even more intimately associated with Great Britain.

Fig. 302. — The Irish Free State

Much of the foreign commerce is with other parts of the Empire. For example, the inhabitants of Jamaica do little manufacturing, so that manufactured goods have to be imported. Many of these come from the mother country, because the British understand their wants.

Their extensive foreign commerce

1. Value of the dependencies for trade

Jamaica has required a great deal of capital for building railroads, wagon roads, sewage systems, plants for drinking water, and other improvements; and the mother country, being immensely wealthy, could best furnish the money. The use of this capital has in

turn brought more demands for manufactured articles; for example, rails, locomotives, and wagons. Since the island has to pay for all these goods, and produces bananas, coconuts, coffee, and other foods, it sends to England in exchange large quantities of these products. In this way considerable commerce has been established with Jamaica. Trade relations with Canada, New Zealand, Australia, and India with nearly 320,000,000 inhabitants are somewhat similar. British colonies in the New World, like Jamaica, trade fully as much with the United States as with the mother country, because of our nearness to them. Yet Britain always enjoys a large share of the trade with every part of the Empire. Her trade with the dominions and colonies is thus seen to be of immense value to her.

© Brown Bros.

Fig. 303. — A passenger steamer at dock, Liverpool

Liverpool has a line of docks on the Mersey estuary more than six miles long. Its great warehouses, where grain, cotton, and tobacco are stored, are very interesting. The grain is conveyed from the docks to these storehouses, one fourth of a mile away, by means of endless belts in underground tunnels.

2. Extent of trade with independent countries

At the same time there is a vast trade between the British Isles and other independent countries, because there are again many needs on both sides. In fact the commerce with other countries is about twice that with British territory. In all, from 2,000 to 3,000 ships enter British ports every week. The trade with the United States is far greater than that with any other part of the world; it is in some years more than one fourth of the entire British foreign commerce.

3. Size of their merchant marine

The transportation of so much merchandise over the sea is itself a great and profitable business. The British own far more merchant vessels than any other nation — so many that they carry freight and passengers for other nations as well as for themselves. Until recently the most convenient route from the United States to South America was by way of England, in British ships. All together nearly 300,000 men are employed in the British merchant marine.

4. Principal shipping routes

Fig. 495 shows the principal routes followed by the British ships. Point out some of them. There are four ways by which ships can go from London to India and Australia. Trace them. One is much shorter than the others. Which is it? What important routes, if any, do the British seem to have neglected?

The chief weakness of Great Britain. — It is evident from all these facts that the British are a very powerful nation. Yet they have one great weakness, — their lack of independence as to their food supply.

© Keystone View Co., Inc.

Fig. 304. — A portion of a village in the highlands of Scotland

This portion of Scotland has only a scattered population, for the soil is thin in most places; farming is possible, for the most part, only in the valleys or basins.

The British Isles have a population of over 47,000,000 — more than two fifths as large as ours — and an area that is only about three fourths that of California. This is a very small area for so many people; yet there is a considerable portion of this area that is not devoted to agriculture. A large part of Scotland and Wales and much of northern England are too mountainous and rocky for intensive cultivation; and some of the plains in southeastern England are too sterile. Farming, therefore, compared with other occupations, is much less prominent than in any other great nation. Only about one fifth of the inhabitants live in the country, and many even of these are factory workers; the farmers therefore fall far short of supplying enough food for all.

Their method of overcoming this weakness. — What do they raise; and what portion is it of the amount needed? **Their farm products** The chief industry in the rural districts is grazing, partly because much of the land cannot be cultivated successfully, and partly because the damp air and mild winters favor the growth of grass. Nearly twice as much land is devoted to grazing as to crops, and dairying is very prominent. Fig. 305 indicates the importance of cattle raising. What other portions of Europe resemble Ireland in number of cattle per square mile? Fig. 306 shows what an enormous number of sheep there are in Great Britain. Only one other section of Europe approaches it in number per square mile. What section is it?

The British Isles are noted for their fine breeds of cattle, sheep, and horses. Three breeds of cattle developed on the Channel Islands—Jersey, Guernsey, and Alderney near the French coast—have been imported extensively into the United States. Many Shetland ponies have come from the Shetland Islands on the north.

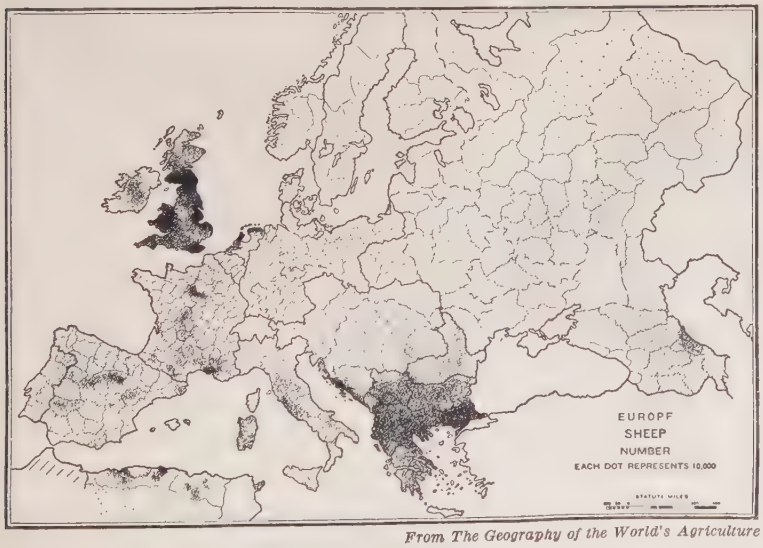
From The Geography of the World's Agriculture

Fig. 305

Milch, beef, and young cattle all are considered in this map. What countries and parts of countries have the greatest number of cattle per square mile? Fodder grows best in cool, moist regions. Explain the distribution of cattle in Italy; in Switzerland; in Ireland, Belgium, The Netherlands, and Denmark.

The leading farm products are the hardy grains, like oats, barley, and wheat; and vegetables such as beans, peas, turnips, and "Irish" potatoes. Ireland raises more potatoes than either England or Scotland. Since there are so many large cities, truck farming is very important. What products does that call to mind? The want of intense summer heat, such as we have, prevents the raising of some of the products that we greatly value; for instance, corn and grapes.

The demand for land is so great that many swamps have been reclaimed by careful drainage; these now make some of the most fertile farms. Furthermore, the soil is tilled much more carefully than in our country. For example, the average yield of wheat per acre is about thirty bushels, while with us it is only fifteen. Yet, in spite of all their efforts, the British produce only a small part of the food that the nation requires; the rest must be imported.



From The Geography of the World's Agriculture

Fig. 306

What two regions lead in sheep raising? Can you name any breeds of sheep that come from England?

The consumption of fish

Fish are caught in large quantities, mainly in the North Sea. Some of the principal kinds are cod, haddock, and herring, as off the

coast of New England and Newfoundland. Another is the sole, which resembles the flounder of our eastern coast. Salmon enter the rivers of Scotland, and oysters are found along the southern coast of England. More than fifty pounds of fish per person are ordinarily caught each year. Do we eat fish at that rate?

© *Keystone View Co., Inc.*

Fig. 307. — An American binder in a wheat field in England

The scarcity of labor in the United States and the great abundance of fertile land have made us great inventors of farm machinery. Our machines are used on every continent (see p. 92).

Much of the food that is imported has to come a long distance. For example, wheat, the most important of all, is brought from the United States, Canada, Australia, and Argentina; the United States usually supplies more than any one of the others. Corn is next to wheat in importance among the grains. Almost any kind of food that you can name is imported in enormous amounts. For instance, about 55 pounds of meat, 8 pounds of butter, 6 pounds of cheese, 46 eggs, 8 pounds of potatoes, 80 pounds of sugar, 7 of tea, and 14 of rice for each person in the islands are brought from abroad each year. Can you name the countries from which some of these articles are probably obtained? These quantities suggest how extensive, and therefore how vital, the imports of food are. If they were entirely stopped, the inhabitants would begin to suffer from famine within a very few weeks.

Foods imported

What means do the British take to insure a regular and sufficient food supply? First, they depend mainly upon their own vessels for transportation. If they relied greatly upon others, vessels might not be available in sufficient numbers when needed; but by having a merchant marine of their own, consisting of more than 10,000 ships, they can always have enough to meet their full need.

How a regular and sufficient supply of food is insured

There is still a grave danger, however, which leads to another precaution. In case of war these merchant vessels might be captured or sunk, and then the inhabitants of the islands would have their choice between starvation and surrender. It was just such a choice that the Germans planned to force upon them in the World War. But England has a navy with which to meet such a danger. Her army is small, because no foreign force can hope to cross the water and make a successful attack upon English soil. Since the merchant marine is so large,

© *Underwood and Underwood*

Fig. 308. — Cleaning herring at a seaport of Ireland

The fishing boats have just arrived and the fish have been unloaded. Women are doing most of the work. Some of the fishing boats are seen in the background. Scotland is even more famous for its herring than Ireland.

however, and may be attacked anywhere, it requires a great many war vessels for its protection. No other navy in the world equals that of Great Britain in strength.

The great seaports. — The seaports of the British Isles are especially numerous and important. The greatest port of all is London, next to New York the largest city in the world. The Thames River has a wide, deep mouth, owing to the sinking of the land; London is situated upon its banks as far inland as high tide allows ocean vessels to go, or fifty miles from the open sea. The advantage of this position is that, while it is in the interior of the island, it has direct water communication with foreign countries.

Reasons for the importance of London

1. Its location

New York City owes its greatness largely to the fact that it is the gateway to an enormous and very productive interior. The area supporting London is tiny in comparison; but it is remarkably productive, and easily reached from the city by rail. Passengers from the United States often reach London most quickly by taking ship to Southampton, where fast trains wait to take them the rest of the way. Locate the latter city.

Nearly 2,000 years ago, the site of London was a fortified camp, situated on a low hill surrounded by tidal marshes and mud flats. There was an ancient ferry at this point; and more than 800 years ago the first London bridge was built. Since then the city has grown until Greater London now includes over 7,500,000 persons, though the official population of the county is 4,485,000, or about three fourths of that of New York (p. 52).

2. Stages in its growth; present size

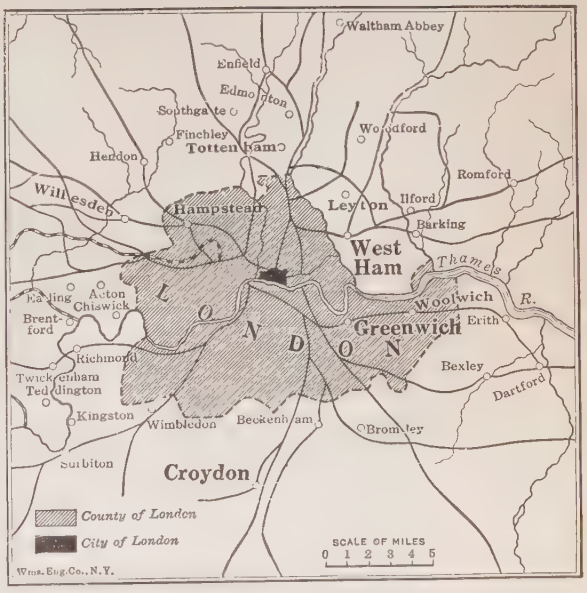


Fig. 309.—London

Only the city and the county of London are shown on this map. The city proper has a night population of 20,000 and a day population of nearly 400,000. Can you account for this difference? Greater London, including suburban districts, extends beyond the limits of this map.

ATLANTIC OCEAN
NORTH SEA
BRITISH ISLES
IRELAND
FREE STATE
IRISH SEA
SCOTLAND
SCOTTISH HIGHLANDS
ENGLAND
WALES
FRANCE
SPAIN
PORTUGAL
NORWAY
DENMARK
NETHERLANDS
BELGIUM
SWITZERLAND
English Channel
Bay of Biscay
SHETLAND ISLANDS
ORKNEY ISLANDS
HEBRIDES OR WESTERN ISLANDS
Cape Wrath
The Minch
Moray Firth
Inverness
Kinnaird Head
Aberdeen
Dundee
Perth
Firth of Forth
Edinburgh
Glasgow
Firth of Clyde
Malin Head
North Channel
Londonderry
Erris Head
Belfast
Sligo
Dundalk
Galway
Galway Bay
Shannon R.
Dublin
Dingle Bay
Tipperary
Limerick
Cork
Mizen Head
C. Clear
Queenstown (Cobh)
Carnsore Pt.
St. George's Channel
Bristol Channel
Cardigan Bay
Mt. Snowdon 3560 ft.
Liverpool
Manchester
Sheffield
Hull
Leeds
Bradford
Halifax
Newcastle
Sunderland
Durham
Dumfries
Solway Firth
Carlisle
Isle of Man
Anglesey
Humber R.
The Wash
Nottingham
Birmingham
Norwich
London
Cardiff
Bristol
Croydon
Brighton
Dover
Folkestone
Thames R.
Plymouth
Falmouth
Lands End
Scilly Is.
Isle of Wight
Portsmouth
Hastings
Strait of Dover
Boulogne
Dunkirk
Ostend
Calais
Cherbourg
Channel Islands (Br.)
Havre
Amiens
Rouen
Caen
Normandy
Brittany
Brest
Paris
Versailles
Fontainebleau
Reims
Verdun
Metz
Nancy
Strasbourg
Lorraine
Vosges Mts.
Black Forest
Rhine R.
Meuse R.
Seine R.
Marne R.
Loire R.
Le Mans
Orleans
Troyes
Angers
St. Nazaire
Nantes
Tours
Dijon
Mulhouse
Basel
Zurich
Bern
Geneva
Mt. Blanc
Alps
Lake of Geneva
Rochefort
Clermont Ferrand
Limoges
Perigueux
Villefranche
Central Plateau
St. Etienne
Lyon
Grenoble
Turin
Gironde R.
Bordeaux
Landes
Cevennes Mts.
Rhone R.
Toulouse
Nimes
Beziers
Montpellier
Perpignan
Pyrenees Mountains
Andorra
Marseille
Gulf of Lyon
Toulon
Nice
Monaco
Gulf of Genoa
Corsica (To France)
Ajaccio
East from Greenwich
Longitude West from Greenwich
La Coruna
C. Finisterre
Santander
San Sebastian
Bayonne
Bilbao
Burgos
Gijon
Leon
Cantabrian Mts.
Helgoland
Friesian Islands
Emden
Groningen
Amsterdam
Haarlem
Zuider Zee
The Hague
Rotterdam
Utrecht
Arnhem
Brussels
Liege
Namur
Charleroi
Aachen
Cologne
Coblenz
Luxemburg
Mainz
Bremen
Hamburg
Munster
Dortmund
Barmen
Elberfeld
Dusseldorf
Muthelm
Wiesbaden
Frankfort
Darmstadt
Manheim
Karlsruhe
Stuttgart
Ludwigshafen
Saarbrucken
Saar Basin
Stavanger
Bergen
Lyndesnäs (The Naze)
Skagerrak
Lim Fiord
Flensburg
Christiania

Fig. 310

NORTHWESTERN EUROPE
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300
Railroads
Canals
Capitals of Countries
HEIGHTS IN FEET
Over 10,000
5,000 to 10,000
2,000 to 5,000
1,000 to 2,000
500 to 1,000
Sea level to 500
Below sea level
WILLIAMS ENGRAVING CO., N.Y.
FINLAND
Helsingfors
Leningrad
Gulf of Finland
ESTONIA
Reval (Tallinn)
Narva
Pskof
Riga
LATVIA
Gulf of Riga
LITHUANIA
Memel (Klaipeda)
Libau (Liepaja)
Mitau (Jelgava)
Dvinsk (Daugavpils)
Vitebsk
Smolensk
Moscow
Tver
Novgorod
Volga R.
Dnieper R.
Dvina R.
Pripet R.
Marshes of Pripet
Minsk
Mogilef
Bryansk
Gomel
Desna R.
Vilna
Wilno
Kovno (Kaunas)
Grodno
Suwalki
Konigsberg
EAST PRUSSIA
(Part of Germany)
FREE CITY OF DANZIG
Danzig
Gulf of Danzig
Pomeranian Bay
RUGEN
BORNHOLM (Dan.)
ALAND ISLANDS
GOTLAND
OESEL
DAGO
Orebro
Stockholm
Linkoping
Jonkoping
Lake Wener
Lake Vetter
Goteborg
Kalmar
OLAND
Kristianstad
Helsingborg
Malmo
Stettin
Oder R.
Berlin
Magdeburg
Posen (Poznan)
Warszawa
Vistula R.
Brest Litovsk
Pinsk
Lodz
Dresden
Leipzig
Chemnitz
Gorlitz
Breslau
SILESIA
Reichenberg (Liberec)
Carlsbad
Prague (Praha)
Troppau
Olmutz
Pilsen (Plzen)
Iglau
Brunn (Brno)
Budweis
BOHEMIAN FOREST
ERZ MTS.
CZECHOSLOVAKIA
Krakow
Przemysl
Lemberg (Lwow)
CARPATHIAN MTS.
Kosice (Kassa)
Presburg (Bratislava)
Vienna
Munich
Linz
Salzburg
Odenburg
Budapest
Debreczen
Miskolcz
Foksy
Szegedin
Lake Balaton
HUNGARIAN PLAIN
HUNGARY
AUSTRIA
Gratz
ALPS
Brenner Pass 4,470 ft.
Innsbruck
Laibach
Agram
Drave R.
Save R.
Padua
Prieste
Fiume
Venice
Gulf of Venice
Pola
Adriatic Sea
Zara (To Italy)
Spalato
DINARIC ALPS
YUGOSLAVIA
Kamenets Podolsk
Czernowitz
BUKOWINA
Dniester
Balta
Bug R.
MOLDAVIA
Jassy
Kishinef
RUMANIA
Nikolaief
Kherson
Odessa
Akkerman
Prut R.
Galatz
Braila
Danube R.
Constantza
Varna
BLACK SEA
Zhitomir
Kief
UNION OF SOVIET SOCIALIST REPUBLICS
WHITE RUSSIA
Volga R.
Valdai Hills
Lake Peipus
Dorpat (Tartu)
Lake Wener
Lake Vetter
Longitude East from Greenwich
15°
20°
25°
30°
35°
55°
50°
45°

Fig. 310

Questions on Fig. 310. — 1. If you wish to find smaller places than are shown on this map, consult Fig. 502. 2. Are the highlands and lowlands in central Europe more regularly situated than in North America? 3. Compare the suitability of Ireland and Scotland for agriculture as shown by this map; of Germany and Poland. 4. What advantages do you see in the location of Brest as a seaport for use in time of war? 5. Consult p. 339 to find how it happens that an area bordering the North Sea in The Netherlands can be below sea level.

---

3. Manufactures and commerce

As in all great cities, one of the principal occupations is manufacturing. In spite of the fact that London does not have coal or iron near at hand and is therefore at a disadvantage for the manufacture of iron and steel products in comparison with Liverpool and Glasgow, it is nevertheless the leading industrial center of England, manufacturing a great variety of products.

Another of its interests is commerce. It is the greatest trading center in the world; its rows of piers extend thirty-five miles down the river, and there are thousands of wholesale stores and importing and exporting establishments. It is not so noted, however, for the export of manufactured goods as some of the other ports. Perhaps you can suggest a reason. It is, however, a very important center for imports, particularly of foods. The great warehouses are filled with products from many lands, such, for example, as sugar, flour, meat, coffee, spices, and tropical fruits. Quantities of tobacco and hides and nearly all the tea and wine consumed in Great Britain enter here.

4. Importance as an educational and money center

It is a center for the publication of books and magazines, and has many noted libraries, picture galleries, museums, and magnificent buildings. It contains one important university; two others that are very old and distinguished are at Oxford and Cambridge, not far distant.

Fig. 311. — Trafalgar Square, London

© Keystone View Co., Inc.

This is one of the principal squares of the city and is bordered by many fine public buildings and monuments. One of the monuments is to Admiral Nelson who destroyed Napoleon's fleet at Cape Trafalgar in 1805 and ended the attempt of the French to invade England.

Just below the city is the Greenwich Observatory, from which meridians of longitude are numbered and time is regulated (p. 229).

Its wealth is so great that it was the money center of the world until recently, when it was outdistanced by New York. The capital for many of the undertakings in South America, Mexico, and other remote countries has been obtained here. The leading bank, called the Bank of England, is the agent of the government in much of its business and employs more than 1,000 persons.

5. Its importance as the center of government

As the capital and metropolis of Great Britain and also as the leading city of the British Empire, London is particularly important. Here is where the King lives and where the Parliament meets that makes the laws for the realm. Like our Congress, it is composed of two parts or houses; but instead of being called the Senate and the House of Representatives, they are known as the House of Lords and the House of Commons. The House of Lords contains members of the nobility, or men with inherited titles, who are not elected by the people. The House of Commons, however, whose members are elected by popular vote, is much the more important of the two. Thus, though the British Government is in form a limited monarchy, the people enjoy a degree of liberty similar to that which exists in a republic.

The King is the nominal head of the government; but the real authority is in the hands of a Cabinet composed of the Prime Minister and several other ministers, who are responsible to the House of Commons for their actions. If the ministers lose the support of the House, they resign. Affairs of the Empire are considered also at meetings of the prime ministers or the representatives of Great Britain and the several dominions.

© *Underwood and Underwood*

Fig. 312. — The Royal Exchange, London

The Royal Exchange, founded in 1556, was originally an association of merchants. It is now a meeting place for business men to discuss financial affairs. In this building are the offices of Lloyd's, the mother of marine insurance.

Ships and other steel goods are extensively manufactured at Cardiff; but that port owes its importance chiefly to its export of coal. Being so near extensive coal fields and facing the Atlantic, it ships great quantities of coal abroad. No ship can carry enough to last it many days. The thousands of ships in the English merchant marine and navy consume an enormous amount, and large quantities have to be kept at the various English coaling stations distributed at convenient points all over the earth. Much of this coal comes from Cardiff. Other countries also that have little coal look to this port for their supply.

The export trade at Cardiff

© *Keystone View Co., Inc.*

Fig. 313. — Trongate, Glasgow

This street is full of historic interest. The stunted spire, spanning the pavement, called the Tron Steeple, is all that is left of St. Mary's Church, built in 1637. On the opposite side of the street is Cross Steeple, a remnant of an old prison.

Before the discovery of America, the western coast of England was near the edge of the known world and of little importance. But the settlement of America placed it in the center of the active world and led to the growth of great cities in that region. Bristol is one of these. It is the port from which John Cabot sailed for America in 1497, as well as many later emigrants. Its location gave it an advantage over other ports on the west coast, so that at one time it ranked next to London in its commerce. Shipbuilding is important, and it imports food and raw materials for manufacture, while exporting coal, pottery, and other manufactured goods.

Why Liverpool has surpassed Bristol in growth

Liverpool, however, is now twice as large and has six times as much commerce. Why should that be, particularly when it is 130 miles farther north? The great manufacturing region just back of it is the main cause. The articles manufactured there pass through Liverpool to all parts of the world. Name some of these articles. Immense quantities of food and raw materials for manufacture likewise enter England through this port. Wheat and cotton are the two most important imports.

Glasgow is even larger than Liverpool, ranking next to London among British cities. Its advantages are like those of Liverpool, since it is the outlet for extensive manufacture of iron and steel goods and textiles in southern Scotland. Its greatest industry, as already suggested (p. 291), is shipbuilding.

The difference between Glasgow and Edinburgh

Edinburgh, two fifths as large as Glasgow, is a very different kind of city. It looks toward the east and therefore trades with the continent. It also has many factories. But it is distinguished rather as the capital of

Scotland and as an educational center. How far apart are the two cities? Which would you expect to have the more smoke and noise?

Belfast and Dublin

The principal cities of Ireland are Belfast and Dublin, which are nearly equal in size (p. 485). One might expect the chief cities of Ireland to be on the west coast, facing America.

1. Reason for their location

The Irish trade, however, is with Great Britain rather than the New World, which accounts for the location of their chief centers of population on the east coast. Even goods intended for America are sent to Liverpool or Glasgow to be reshipped.

2. Difference between them

Dublin and Belfast differ somewhat as do Glasgow and Edinburgh. Belfast is the chief manufacturing center of Ireland, and is noted particularly for linen goods and shipbuilding. Dublin is the capital of the Irish Free State, and is noted for its beauty and its educational institutions.

Photo from Brown Bros.

Fig. 314. — The launching of the *Titanic* at Belfast

Several of the greatest steamships that have ever been built were made at Belfast, now the capital of Northern Ireland. In 1912 the *Titanic* was wrecked in mid-ocean by collision with an iceberg, and sank with a loss of 1,517 lives.

The contrast between Great Britain and Ireland. — Great Britain has an abundance of minerals, manufactures very extensively, and depends largely upon other regions for food. It contains many great cities, and only about one fifth of the population lives in the country. Name at least six large cities in England, two in Scotland, and one in Wales.

Ireland contrasts with Great Britain in every one of these respects. Because of its lack of minerals and its abundance of arable land, it is devoted to farming to a much greater extent than Great Britain; for that reason it is a particularly important part of the British Empire. Many of its farm products are sent across the Irish Sea through the ports just named. Its manufacturing, on the other hand, is very limited. It has only two large cities, the great majority of its inhabitants living in villages and in the rural districts. Explain the reasons for this preference for the country.

Facts to be especially well fixed. — 1. The latitude of London compared with that of New York. 2. The climate of these islands. 3. Character of the surface. 4. Leading minerals. 5. Leading manufactures, and their location. 6. Location and importance of London; Birmingham; Bristol; Sheffield; Liverpool; Edinburgh; Manchester; Glasgow; Dublin; Belfast. 7. Principal farm products. 8. Principal imports and exports.

Problems for independent study. — 1. Would you expect Pullman cars to be used in Britain to a greater or less extent than in the United States? Why? Robinson, E.: *Commercial Geography* (1910), p. 404 (Rand McNally); Winslow, I. O.: *Europe*, p. 13 (Heath). 2. There are so many large estates in these islands that more than half of all the farmers are renters or tenants. Is that a good or bad condition? Why? See the discussion of this topic in the treatment of France, p. 312; consult also Carpenter, F. G.: *Europe*, pp. 31, 61, Winslow, I. O.: *Europe*, pp. 22–23 (Heath). 3. In our Civil War the North declared a blockade of the South and prevented the export of cotton to England. Find out what the effect was upon England. Larned, G. N.: *History of England*, p. 613, or any good history of England. 4. Find out the main reasons why Northern Ireland did not become part of the Irish Free State. Will Northern Ireland probably be satisfied with its present relationship to Great Britain? 5. Has it been an advantage or disadvantage, in each of the following respects, for the British nation to be separated from other nations by water: — (1) In regard to ravages by contagious diseases? (2) In regard to the need of keeping a large standing army? (3) In the number of wars it has had to wage? Allen, N. B.: *Industrial Studies: Europe*, p. 74 (Ginn); Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, p. 394 (Wiley); Tarr, R. S., and von Engeln, O. D.: *New Physical Geography*, pp. 366, 603 (Macmillan). 6. How does the Panama Canal influence the commerce of London and Liverpool? Why? National Geographic Magazine, 1914, vol. 25, pp. 245–248; Browne, E. A.: *Peeps at Many Lands: Panama*, pp. 83, 84 (Macmillan). 7. Read the part of the story of Silas Marner which tells how spinning and weaving were carried on before the introduction of modern machinery. 8. Make a list of articles manufactured from flax and collect samples of them. World Book, under the subject of *Flax;* Cooley, A. M., and Spohr, W. H.: *Household Arts for Home and School*, vol. 1, pp. 293–307 (Macmillan). 9. Write a short paper telling in what ways the inhabitants of the United States and the British Isles are dependent upon each other. Allen, N. B.: *Industrial Studies: Europe*, pp. 73, 77 (Ginn); Chamberlain, J. F., and Chamberlain, A. H.: *Europe*, rev. ed., Chapter II (Macmillan). 10. Make an outline map of Great Britain and indicate the principal mountains, rivers, cities, and canals. Make a similar map of Ireland.

© E. M. Newman

Fig. 315. — An Irish farmhouse

The walls of this house are made of stone obtained from quarries near by. The roof is thatched. Because of the heavy rains and mild temperatures the grass is always green and the trees luxuriant. Why is Ireland called the Emerald Isle?

2. France

Advantages of France for commerce. — France is better situated for commerce than Great Britain. It is as near the center of the active world as England; its coast line on the Atlantic puts it in close touch with America; and its Mediterranean coast brings it much nearer than England to the many peoples bordering on that sea. On its land frontiers it touches six other countries, which have an unusual

Advantages of position

variety of products and demands; and the fact that it forms the neck for the Iberian Peninsula makes it an important region for commerce by land between the Mediterranean and the Atlantic.

Fig. 310 shows how extensively these advantages of position have been improved.

Improvement of these advantages by canals

Trace the four large rivers, the Seine, Loire, Garonne, and Rhone, and note how they are connected by canals. Show how freight can go by water from Marseille to Bordeaux; to Orléans; to Paris and Havre; also, how it can go from Strasbourg to Paris and Havre; or from Strasbourg to Lille and Calais. About one fourth of all the foreign trade of France is in goods that thus cross it on the way from one foreign country to another. Compare the distance from Naples in Italy to London by river and canal across France with that by ship around Spain.

The protection of France from enemies by its natural boundaries. — From most directions an enemy would find it difficult to invade France. About half of the boundary is water. Mountains furnish excellent protection for most of the other half. The Pyrenees have no easy passes over them, so that there are no railroads across them, and scarcely any wagon roads. The only way to pass them is to go around at either end. Follow the course of the railways from France to Spain in Fig. 310. The lofty Alps separate France from Italy and Switzerland, and farther north are the Jura Mountains, the Vosges, and the Ardennes. Locate these on the map. There are a few passageways through these mountains; but they are narrow and easily defended. The Belgian border furnishes the only easy approach into France for an enemy.

The area occupied by the Germans in the World War. — The portion of France occupied by the Germans just before the beginning of their final retreat in July, 1918, is shown in Fig. 318. They had overrun almost all of Belgium, so as to make use of the easy road toward Paris just mentioned. That was their main route. There was another from Metz past Nancy and Verdun. There was still another through the pass at Belfort between the Rhine and the Rhone valleys; but these were difficult. In fact, east and northeast of Paris,

How they approached it

© Brown Bros.

Fig. 316. — French canal boats

France has 3,100 miles of canals, of which 3,050 miles are used. Almost any part of France can be reached by canal except the Central Plateau. On Fig. 310 trace routes from Bordeaux to the Rhine; from the Rhine to Paris.

© *Press Illustrating Service*

Fig. 317. — Brest

Brest is an important naval port. This view shows the barracks, hospital buildings, and training-ship schools belonging to the French navy. Gun foundries, shipbuilding yards, and repair docks line the water front near by.

country. About what part? Estimate the distance of Paris from the Belgian border; from Spain. Why was the loss of this region, then, so serious?

It was a far worse blow to the French than the area suggests. In the first place, this region contains the principal coal mines of France (see Fig. 288). That country has never mined enough coal for its own use; but about three fourths of its whole output came from this section, near the city of Lille, where the coal fields are an extension of the deposits of southern Belgium. Find Lille on the map (Fig. 310). Neither had France mined all the iron ore that she needed; about seven eighths of her supply had come from near the boundary east of Verdun, a section that was likewise included in the area occupied by the Germans.

as indicated in Fig. 310, are natural barriers in the form of several rows of hills that have gentle slopes toward Paris but steep outer faces toward Germany. These hills had either to be crossed one after another, which was recognized by the Germans as next to impossible; or the narrow and winding river valleys cut through them had to be followed. Verdun guards one such valley, but that also proved impassable. These rows of bluffs, arranged in the form of a half circle, one inside another, were a great protection to Paris.

The section of France occupied by the Germans in 1918 contained only about 10,000 square miles, which is but a small part of the total area of the country.

Value of that region to the French

Fig. 318. — The battle lines in 1918

The presence of coal and iron in northern France had naturally led to the extensive manufacture of iron and steel goods. The coal had led, also, to textile industries that were far more important than the iron and steel industry, particularly the manufacture of woolen, cotton, and linen goods, most of the textile mills being within the conquered area.

This occupied area was therefore the portion of France that most nearly corresponded to northern England in the extent of its mining and manufactur-

© A. N. Mirzaoff

Fig. 319. — A scene in the devastated area of France

Nearly all the cities and villages of the northeastern part of France and many in Belgium were destroyed by explosive shells and fire. It will require hundreds of millions of dollars and many years' work to restore these cities.

ing; it was the workshop of France. Its loss deprived France not only of many of her raw materials for manufacture, but of much of her machinery for making firearms, uniforms, and scores of other things absolutely necessary in war. On the other hand, what the French lost, the Germans gained. The value of this region for manufacturing was a second reason, therefore, why the Germans were so eager to enter France from the north, near Lille.

Why the Germans believed that the capture of Paris would end the war. — They thought that the possession of this valuable territory would enable them to capture Paris with ease. The fall of Paris, they thought, would certainly end the war, at least so far as France was concerned. And they had good reasons for thinking so.

General importance of the city

Paris is the fourth largest city in the world. Anyone who goes to France visits Paris as a matter of course. It is the leading city in France to a much greater extent than New York is the chief among our cities. With nearly 3,000,000 inhabitants, it is almost six

times as large as any other city of France, and the principal railroads converge toward it much as do the spokes of a wheel toward the hub. It is probably the most beautiful city and the greatest art center in the world; and it is the greatest manufacturing city in the country.

As the capital of the republic it has peculiar importance. It is here that the President has his official residence and the Chamber of Deputies, corresponding to our Congress, meets for legislation. The schools of the entire land are controlled from a central office in Paris. And as the schools are affected, so are almost all other institutions and undertakings; in fact, while the government is representative, all parts of France look to Paris for guidance to a degree that is hard to understand in the United States.

Its importance as the capital of the republic

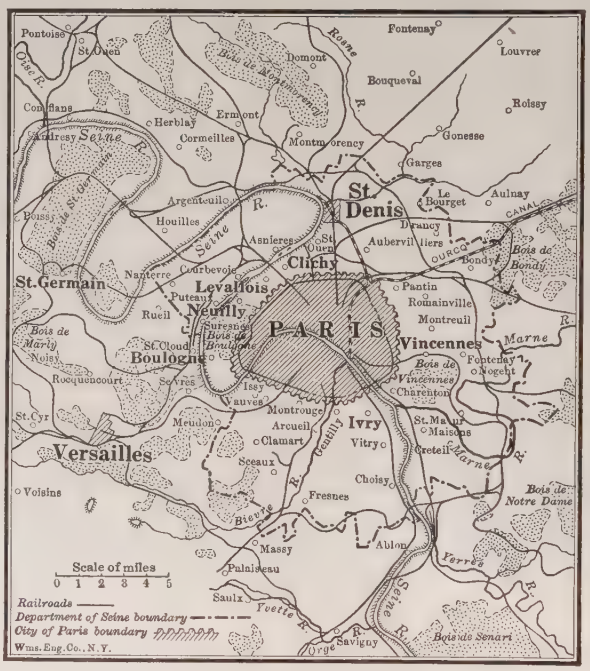


Fig. 320. — Paris and vicinity

Trace the course of the Seine River across the map and, by use of the scale, estimate the length of the section of it shown here. What other rivers shown here were scenes of great battles in the World War?

Resources of the French. — While France was terribly crippled from the start by the loss of her northern territory, she still had two important sources for raw materials. First, she had other mines and factories. Two of the principal mineral regions that remained were Le Creusot and St. Étienne, both in the highlands of southeastern France (Fig. 502). In each of these iron ore and coal are found near together; Le Creusot was accordingly the greatest center in France for the manufacture of munitions. Rouen, on the lower Seine River, is noted for its cotton manufacture. Paris has already been mentioned as important for its manufactures; and there were some other woolen, cotton, and linen factories at a safe distance from the occupied territory.

Other sources of raw materials

Other help was found in imports. England came to the rescue of France with her abundant supply of coal. It is only a short voyage from Cardiff to Bordeaux, which was a safer port than those closer to England. Why? Estimate the distance. Iron ore, also, was imported from Spain and from Algiers. Where did it probably enter France?

Any country ordinarily imports large quantities of food, because no one produces everything that it wants. Yet the comparative independence of the French in this respect was a great comfort to them throughout the war. The area of France, even including the territory regained at the end of the war, is 212,700 square miles, and its population a little less than 40,000,000. Recall the area and population of the British Isles. How much greater is the area of

Superiority over Britain in regard to food supply

1. Advantage in area and population

© *Manufacturers' Aircraft Assn.*

Fig. 321. — An airplane view of the Opera, Paris

France? How much less is the population? Thus France comes much nearer than England to being able to feed herself without outside assistance.

2. Advantages in character of surface and in climate

Fig. 310 shows the portions of France that are reasonably level and therefore fit for cultivation. Locate them. Make a rough estimate of their area compared with that of the plains in the British Isles.

The principal highlands are well toward the east. Among these are the Alps, whose loftiest peak, Mont Blanc (15,781 feet), is in French territory near the boundary. As there are no mountains in the west, the winds from the Atlantic carry a fair amount of rain to all parts of the country.

Since France lies farther south than England and is less under the influence of the ocean, its summers are considerably warmer. In what temperature regions is France (Fig. 290)? The southeastern section, particularly the part along the coast called the *Riviera*, enjoys warm temperatures both in summer and in winter. This is because of winds that blow over the warm Mediterranean waters, and the protection from cold north winds afforded by the mountains (p. 285). Thus France has more extensive plains, a greater variety of climate, and warmer summers than Britain. These facts help to explain why more than one half of all the people live in the country, while in Great Britain, as we have seen, only about one fifth live outside of the cities.

France is chiefly a land of farmers, rather than a land of industrial workers like England.

In one important respect the French farmers are much better off than the British: four out of five of them own their land, while a majority in Britain are renters. This fact of ownership affects not only the care given to the fertilization of the soil and to the amount of produce, but also the contentment and patriotism of the French. Why should it have these effects?

3. Superiority of conditions for farming

© *Underwood and Underwood*

Fig. 322. — Nice, a French city on the Riviera

The Riviera is a narrow strip of coast extending from Nice eastward around the Gulf of Genoa. Being a south-facing slope and protected from cold north winds by the western spurs of the Alps, it has semi-tropical vegetation. The mild temperatures, the beauty of the coast, and bright skies make it a favorite winter resort.

The French farms would seem to us small; for a great proportion of them contain less than twenty-five acres. What possible advantages do you see in so small a size? The farmers do not usually live on their lands as we do, but have their homes in small villages that are near enough for them to go back and forth easily. Is such an arrangement any improvement over ours?

4. Their greater variety of farm products

All the farm products that are prominent in the British Isles are found in France. Wheat, oats, and rye are extensively grown. In fact, the French are more accustomed to wheat bread than any other European nation; and they raise more wheat than any one of them except Russia, although not enough to meet their need. Fig. 368 indicates the extent of wheat production. What facts of interest do you observe in that figure? The highlands and plains not adapted to cultivation are given up to grazing, and there are many millions of cattle and sheep, as in the British Isles. See Figs. 305 and 306.

On account of the warmer climate, also, many crops that are not important in the British Isles are cultivated here extensively: for instance, corn, grapes, sugar beets, figs,

nuts, oranges, lemons, and olives. The most important of these is the grape; in fact, this fruit is the most valuable of all French agricultural products, more grapes being raised in some years than in any other country in the world. While the French have an advantage over the British in the greater variety of their crops, we enjoy a similar advantage even over the French. Show that this is true.

Prospects for mining and manufacturing in the future.

The supply of coal, iron ore, and water power

— France, as we have seen (p. 308), has never been well supplied with coal; she has produced less than one ninth of the amount mined in Britain, and less than one twentieth of that in the United States. She has ranked far below the United States and Germany, also, in her production of iron ore. As a result of the war, however, her supply of minerals has been greatly increased; for the area containing Strasbourg and Metz, including the provinces Alsace and Lorraine, was restored to her, with its great deposits of iron ore; and she acquired coal mines in the Saar Valley, in Germany, just north of Lorraine. In this way her supply of coal has been considerably increased and her supply of iron has been doubled, so that she now ranks high among the countries of Europe in its production. Possibly, also, a much greater use will be made of water power in eastern France for the production of electricity, since France now controls both slopes of the Vosges Mountains. Such power is abundant there, and considerable use of it has already been made.

© *Underwood and Underwood*

Fig. 323. — A village scene in France

Thus France has the prospect of a great increase in mining and manufacturing.

The chief manufactures also have been increased by the acquisition of Alsace and Lorraine. The most important is the textile industry, including woolen, cotton, linen and silk

From The Geography of the World's Agriculture

Fig. 324

France leads in the production of grapes, but Italy has more acres in vineyards. Grapes are grown in many parts of France; the chief centers for the manufacture of wine are the Bordeaux region, the Champagne region east of Paris, and the Rhone Valley.

goods. The first three are carried on mainly in the north, where coal can easily be obtained either from French or Belgian mines. Many sheep are raised in that section, too, while wool from Argentina and Australia, cotton from the United States, and flax from Belgium and Russia can readily be imported through the ports near by. Name some of them.

Principal kinds of manufactures

1. Of textile manufacture

The silk industry is largely confined to the Rhone Valley, because its climate and soil are favorable to the growth of the mulberry tree, on the leaves of which the silkworm is fed. Coal mines are near, and more raw silk is imported conveniently from the Orient through Marseille. Lyon is the chief center for this industry; St. Étienne and Paris are also noted for their silks.

The production of the raw silk is an important occupation in itself. The Orient produces over nine tenths of the raw silk of the world, but in the Rhone Valley one sees grove after grove of mulberry trees. The silkworm moth, at the end of the caterpillar stage, weaves a cocoon about itself. The material of which the cocoon is composed is a thread, about a third of a mile in length, which must be carefully unwound. The single thread is so extremely fine that in order to make a fiber strong enough for spinning

© *Brown Bros.*

Fig. 325. — Strasbourg

As shown in the picture, a part of Strasbourg still keeps its old appearance, its narrow streets, and quaint, timbered houses. The spires in the background belong to an interesting cathedral built many hundred years ago.

and weaving, it must be united with several others.

Since the worms are reared under cover, the silk industry may be carried on in any climate where the mulberry will grow; but the feeding of the worms and the changing of the cocoons into raw silk for the market require much labor and skill. For such an industry to be profitable, industrious, careful, and inexpensive labor must be available.

2. Of other manufactures

The manufacture of iron and steel goods, which has heretofore ranked next to the textile industry, has already been discussed (p. 308). It is rapidly increasing in importance. Three other industries are also important, namely, the manufacture of wine, beet sugar, and pottery.

Value of French taste and skill in manufacturing

How does France compete successfully in manufacturing with other countries, when they have so much larger supplies of coal and other raw materials? The answer is found in the peculiar taste and skill of the French. They have an unusual appreciation of what is graceful, delicate, or elegant. They can both design and finish articles that make a stronger appeal to customers than do articles made by others. For example, many of our fashions in dress come from France; a gown, a pair of gloves, or a hat from Paris is thought by many a trifle more desirable than one bought elsewhere. On that account their goods maintain their place in the best markets and command the highest prices.

The French, therefore, do not attempt to compete with others so much in the quantity of goods turned out as in their attractiveness. They undertake the lighter and finer kinds of manufactures, such as scientific apparatus, jewelry, clocks, locks, steel pens, and needles among metal goods; tapestries, shawls, and laces among textiles; and chinaware and porcelains in pottery. More than one half of the pottery made at Limoges is sold in the United States; their pottery made at Sèvres near Paris is likewise famous. French soaps and perfumes are everywhere recognized as being especially good.

© *Brown Bros.*

Fig. 326. — Saarburg, on the Saar River

Saarburg dates back to Roman times. Parts of the old wall that once surrounded it are shown in the background of the picture.

Use of the sea. — Since the sea forms more than one half of the boundary of France and harbors are numerous, it is natural that many men should engage in fishing, although the number is less than in Great Britain. **Extent of fishing**

Naturally, also, the French have taken an active part in exploration and the founding of colonies. Their emigrants to New Orleans and Quebec in the early days were

© *Brown Bros.*

Fig. 327. — The Bourse (Stock Exchange), Lyon

This building is one of the finest in Lyon. The Exchange occupies only the ground floor. On one of the upper floors is the noted *Museum of the History of Textiles*, in which the story of the weaving industry is illustrated by nearly 400,000 exhibits.

so numerous that the former city still has its French quarter, and French is the common language in the province of Quebec. France now possesses a large number of colonies, particularly in Asia and Africa (Figs. 400 and 473).

Extent of French colonies

The leading seaport is Marseille, located twenty-five miles east of the Rhone River because of the marshy character of the land nearer its mouth. Recall the distance of New Orleans from the mouth of the Mississippi (p. 121).

Importance of their leading seaports

Marseille is the gateway between the Mediterranean countries and the Orient on the one hand, and, on the other hand, the many parts of France that can best be reached through the Rhone Valley and the numerous canals and rivers connected with it. Recall some of these water routes (p. 307). Its position opposite the French colonies in Africa, Algeria, Tunisia, and Morocco, gives it a special advantage for trade.

It may seem surprising that no French port on the Atlantic approaches Marseille in importance. Among these are Havre at the mouth of the Seine, Boulogne near the Belgian border, and Bordeaux on the Garonne River. Yet no one of these has more than about a third of the commerce of Marseille.

On the other hand, Marseille itself is decidedly inferior to London or Liverpool. One reason for the inferiority of France in foreign commerce is that, though it has numerous harbors, few of these are deep enough for the largest vessels. Besides, there is not the need of extensive trade that exists in the case of Great Britain, for the French are less dependent upon other countries. Since they raise a large part of their food, they do not need to import so much as the British; neither do they require so great a merchant marine and navy. Again, since they manufacture the less bulky kinds of goods, they need to import fewer raw materials; and

Reasons for the small trade of the French ports

© *Brown Bros.*

Fig. 328. — Limoges

Limoges, situated on the right bank of the Vienne River, is famed for its fine porcelain; and for its *kaolin* (pure white clay used to make chinaware), large amounts of which are exported from here to America and other countries.

© Keystone View Co., Inc.

Fig. 329. — The harbor at Marseille, France

Note the great variety of merchandise piled on the wharves. What other harbors of which you have read are protected by breakwaters?

they have fewer, though more costly, goods to export. Their foreign trade is thus only about half as large as that of the British.

Facts to be especially well fixed. — 1. Location of plains and highlands. 2. Location of mountain systems on the border. 3. The temperature regions and the distribution of rainfall. 4. Names and location of chief rivers. 5. Prominence of mining. 6. Leading farm products. 7. Leading manufactures. 8. Location and importance of Paris; Lyon; Marseille; Lille; Havre; Bordeaux; Boulogne.

Problems for independent study. — 1. There has been talk of a tunnel to connect France and England. About how long would it be? What would be some of the benefits derived from it? 2. Great quantities of garden truck are sent from France to London. What routes does it take? What is the distance? 3. Do you believe that the capture of Paris by the Germans would have ended the war? Why? Herbertson, A. J.: *Descriptive Geography of Europe*, pp. 218–222 (Macmillan). 4. What large city in New England is in about the same latitude as the Riviera? 5. Give two reasons why the colonies of France are unlikely to increase her commerce as much as those of Great Britain increase British commerce. 6. Draw an outline map of France, and sketch in the principal highlands, rivers, and cities. 7. An interesting industry, which is not described in your text, is carried on extensively in the southeastern part of France. Be prepared to tell your classmates about it. Packard, L. O., and Sinnott, C. P.: *Nations as Neighbors*, pp. 368–371 (Macmillan). One of the chief centers of this industry is the town of Grasse in the Riviera. 8. Read about the peculiarities and customs of the French. George, M. M.: *Little Journey to France*, pp. 44–61; Finnemore, J.: *Peeps at Many Lands: France* (Macmillan). 9. Why is Paterson, N. J., called the "Lyon of the United States"? Chamberlain, J. F., and Chamberlain, A. H.:

Fig. 330. — North Central Europe

This map shows you some of the many petty states that are included in Germany. Before the World War these were closely knit together in the German Empire. During the first few years after the war there seemed to be some likelihood that this confederacy of states might easily fall apart; but the union now seems more stable.

Europe, rev. ed., Chapter XIX (Macmillan). 10. How can you test silk to see whether it is pure? Kinne, H., and Cooley, A. M.: *Shelter and Clothing*, pp. 192–193, 197–198 (Macmillan); Turner, A.: *Sewing and Textiles*, pp. 145–157. 11. Learn all you can about the wars France has had in Morocco and Syria in recent years. 12. Find out how the Locarno Security Treaties lessen probability of war.

3. Germany

The stage of development reached by Germany in 1914. — At the beginning of the World War Germany had an area of about 209,000 square miles and a population of 65,000,000. Russia was the only country in Europe that had a larger population; and only two others, Russia and Austria-Hungary, were greater in area. How did Germany compare with the British Isles and with France in area and population?

Like the United States, she had recently made the advance from an agricultural to an industrial nation, only about one third of the people living on farms. In the production of iron ore she ranked next to the United States, and in amount of coal mined she stood next to Great Britain and the United States. As a manufacturing country, also, she was surpassed only by these two.

She possessed colonies in Asia, Africa, and the Pacific Ocean; she had a larger foreign commerce than any other country except the British Isles; and she was beyond question the most powerful nation on the continent.

Why Germany was very dependent in regard to food. — Notwithstanding her high rank, she was a very dependent country. She had about 310 inhabitants to the square mile,

CENTRAL EUROPE
IN 1914
Scale of statute miles
0 50 100 200 300
NORWAY
SWEDEN
GULF OF BOTHNIA
Lake Onega
Lake Ladoga
ALAND IS.
Helsingfors
St. Petersburg
Gulf of Finland
Christiania
Stockholm
Reval
DAGO I.
OESEL
BALTIC SEA
GOTLAND (To Swed.)
Gulf of Riga
Riga
ALAND (To Swed.)
NORTH SEA
DENMARK
Copenhagen
Memel
Kovno
BORNHOLM (To Den.)
Memel R.
HELGOLAND (To Ger.)
Danzig
RUSSIA
ENGLAND
NETHERLANDS
The Hague
Amsterdam
Elbe R.
Berlin
Oder R.
Vistula R.
Warsaw
Dniester R.
Brussels
BELGIUM
LUXEMBURG
Rhine R.
GERMANY
Kief
Prague
Paris
FRANCE
Danube R.
Vienna
Budapest
AUSTRIA-HUNGARY
Pruth R.
Dniester R.
Odessa
Bern
SWITZERLAND
Rhone R.
Po R.
Fiume
RUMANIA
Bucharest
MONACO
Zara
Belgrade
SERBIA
BLACK SEA
Danube R.
CORSICA (To France)
MONTE NEGRO
BULGARIA
Sofia
Rome
Cetinje
Constantinople
Bosporus
TURKEY
ITALY
ADRIATIC SEA
Tirana
Sea of Marmora
SARDINIA (To Italy)
ALBANIA
Dardanelles
AEGEAN SEA
ASIA MINOR
Smyrna
MEDITERRANEAN SEA
SICILY (To Italy)
Athens
RHODES
AFRICA
MALTA I. (To Gt. Br.)
CRETE
Longitude East 16° from Greenwich
WMS. ENG. CO.
1123

Fig. 331

which was somewhat less than the number in the British Isles. Find out how much less. Yet the difference was not great enough to relieve the people from similar anxiety in regard to their food supply.

We can, perhaps, better understand the situation by comparing Germany with a portion of our own country. The area of the four states, Iowa, Missouri, Illinois, and Indiana, is 218,600 square miles, which is a little more than that of Germany; and their population is 15,224,000, or about a fourth of the former population of Germany. The difference in population is strikingly shown when the number of large cities is considered. In these states there were in 1920 only five cities with populations exceeding 100,000. Can you name them? In Germany, however, there were more than forty, eighteen of which contained at least 250,000 inhabitants. Berlin, the capital, was nearly as large as Chicago, and six others — Hamburg, Munich, Leipzig, Dresden, Cologne, and Breslau — had each more than 500,000. Locate these seven cities and note how they are distributed over the country.

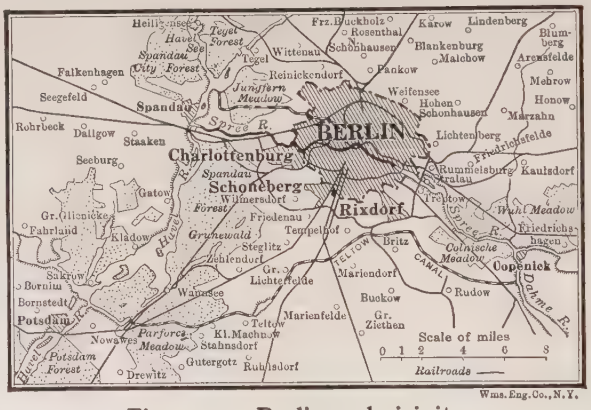


Fig. 332. — Berlin and vicinity

About what is the area of the city of Berlin? Find out why Potsdam is famous. Note the importance of Berlin as a railway center.

If forty large cities were located within the four states named above, they would seem to us very close together; and while this portion of the United States is especially fertile, if it were called upon to support three or four times its present population there would be danger of many persons going hungry. Yet during the war Germany was even more hard pressed to secure food than these four states would be under such circumstances. Let us see why.

How Germany compares in relation to agriculture with some of our North Central States. — In the first place, the soil is by no means so fertile as that of the states which we have just chosen for comparison. Not only is the land mountainous in the south and west, but a large portion of the plain in the north and east is very sandy. This explains why one fourth of the whole area is still forested, and another considerable part is kept in pasture: it is not fit for other purposes. Only about one half of the entire surface is under cultivation. How does that compare with the proportion in Iowa (p. 54)?

Again, the altitude of the southern part and the general slope of the land deprive Germany of the hot summer weather that we find so necessary for some of our most important crops. The southern portion is a somewhat irregular plateau from 1,000 to 2,000 feet in altitude, with many higher ridges or mountains. In the extreme south on the northern slopes of the Alps one mountain peak rises about 10,000 feet above sea level. The lowlands are in northern Germany, which is rarely more than 600 feet in elevation. Near Holland this plain is very low and flat; but in most parts it has a rolling, irregular surface, owing partly to the action of the Ice Sheet.

The general slope of the land, therefore,

is toward the north, as is indicated by the rivers. Name and trace those that flow toward the Baltic Sea. Only one important stream rising in Germany flows eastward. Which one is it?

Thus, in spite of the number of degrees of latitude included in the country, the southern plateau is hardly warmer than the northern plain. Only in the sheltered valleys of the south can grapes be grown, and very little corn is grown anywhere in the country. In what temperature region is Germany?

The rainfall is barely sufficient for agriculture (Fig. 291). While in our four states named above it ranges from thirty to forty inches (Fig. 18), in western Germany there are only twenty-eight to thirty and in the section near the Polish border only about twenty inches. Thus the rainfall conditions for agriculture are much less favorable in Germany than in the section of the United States to which we have referred.

their own barn manures and other fertilizers.

They had also experimented extensively with different kinds of crops, so as to discover the most profitable ones and the conditions most favorable to their production, and had made extensive use of farm machinery.

Photo from Brown Bros.

Fig. 333. — The University of Berlin

Before the World War, American scholars often went to German universities to complete their education. In the confusion and poverty that followed the war, these universities had a hard struggle for existence.

The success attained in agriculture, and some of the principal products. — How successful had the Germans been in agriculture? And what were their principal products? In spite of the disadvantages which we have noted, they had done well. They had studied the soil to better advantage than most nations; and they had taken great pains to fertilize it properly. For this purpose they had imported large amounts of nitrate of soda from Chile (p. 270) and had made the fullest possible use of

Subjects of special study in agriculture

In consequence, they had very greatly increased their yield per acre over what it had formerly been; and while they still, like the British, had to import vast quantities of food, they approached the leadership of the world in several important crops.

Farm products in which the Germans have been especially successful

One of these was rye. This is especially adapted to Germany, because it will grow in soil too poor for the successful production of other cereals. For this reason it has been called the "grain of poverty." It is

grown in nearly every section of the country. Russia, on account of its enormous area, far exceeded Germany in acreage devoted to rye and in amount harvested, but the yield per acre in Germany was more than double that of Russia. Because it could be grown so successfully, rye had long been the principal material for bread in Germany, all classes of people eating black rye bread, at least to some extent.

Fig. 334. — Gathering potatoes in Germany

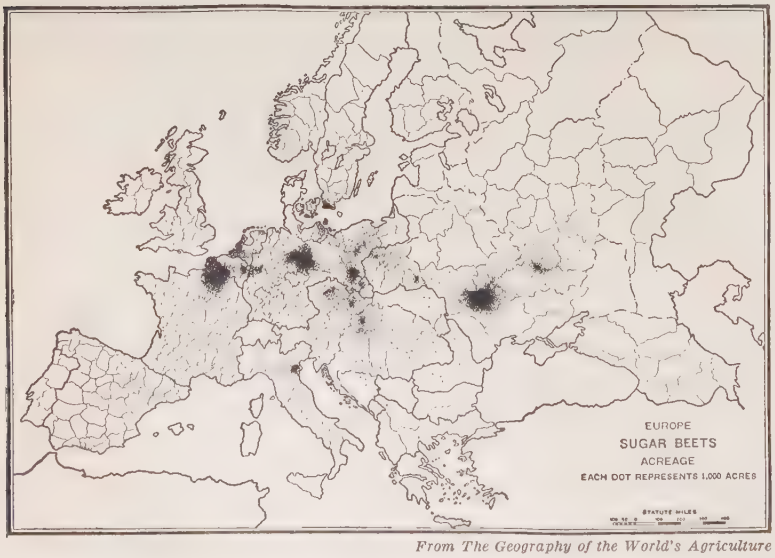
Note the number of women engaged in manual work. In general, much more work in the fields is done by women in the Old World than in the New. What are the rounded piles in the background?

In the production of potatoes Germany surpassed all other countries. Fig. 490 again shows a greater acreage in Russia; but the yield per acre there is much less. Although Germany is small compared with the United States, she has usually had four times as much land in potatoes as we have had; and the yield per acre has been nearly twice as great. Evidently this New World plant has been more appreciated in its adopted than in its native home.

Germany surpassed all other countries, also, in the production of sugar beets. Fig. 335 shows the principal sugar-beet areas of Europe. Locate them. In 1914 Germany was producing about four times as many sugar beets as the United States.

Since much of the lowland is too sandy and much of the upland too rugged for cultivation, it is not surprising that one sixth of all the surface is used for pasture. Cattle for beef and for dairy purposes were kept in nearly all parts of the country, but they were most numerous in the western section, where the greater rainfall causes a more luxuriant growth of grass than elsewhere in Germany (Fig. 305). The number of cattle exceeded that of any other European country except Russia.

Largely because wool could be imported so cheaply, the number of sheep had fallen off; but swine had become



From The Geography of the World's Agriculture

Fig. 335

The production of sugar beets is concentrated in a few sections of Europe. Locate these centers on Fig. 310.

very important, as shown in Fig. 336. In the United States we find that swine are most numerous in the Corn Belt, being fattened on corn. In Germany, however, where there is little corn, the number is due largely to the abundance of potatoes and of by-products from the dairies. In what section of the United States are hogs fattened chiefly on milk products?

Hay, oats, and barley were other important crops of the northern plain, while in the warm Rhine Valley and other sheltered valleys of the south, hops, tobacco, and grapes were raised. The quantity of grapes, however, was small in comparison with that of both France and Italy, as can be seen in Fig. 324.

In spite of such success in agriculture, about one third of Germany's imports, which were enormous, consisted of foodstuffs. The leading foods obtained from the United States were lard, wheat, corn, dried fruits, and meat.

From The Geography of the World's Agriculture

Fig. 336

What part of Europe has the greatest number of swine per square mile? Is this in the corn-raising region of Europe (Fig. 392)? European hogs are fed chiefly on dairy products, potatoes, and barley.

The similarity between Germany and Great Britain in development of manufacturing. — Just as in Great Britain, the dense population of Germany had turned to manufacturing as one means of paying for its imports of food. The raw materials at hand, also, were nearly as favorable to such industry as in Britain. Fig. 288 shows the location of coal beds. Notice how well distributed they are. Extensions of those in northeastern France and in Belgium are found at intervals eastward across Germany to the Polish border. Germany was mining nearly 200,000,000 tons of coal per year, while the amount mined in Great Britain was about 250,000,000, and in the United States about 500,000,000. Thus Germany stood next to Great Britain in fuel production.

How the two countries compared in mineral products

In production of iron ore the Germans had far surpassed the British, their annual output being over 20,000,000 tons, while that of Great Britain was only about one half as much. As in Great Britain, also, these two minerals were mined close together. Where is this done in the United States (p. 120)?

Germany led all the countries of Europe in the production of silver, and was one of the leaders in the mining of zinc. Other mineral products were lead, copper, and salt. The salt beds at Stassfurt, near Magdeburg, were the chief source of the world's supply of potash, which is valuable not only for fertilizer, but also for the manufacture of glass,

soap, gunpowder, and many chemicals. Thus Germany ranked close to Great Britain as a mining country.

How did the two countries compare in manufacturing? All the types of manufacturing that are prominent in the British Isles were important in Germany, in addition to many others. Germany was refining about twice as much iron as Britain, and had become noted for the extent and quality of her iron and steel manufactures. These included not only ships and weapons for war, but machinery, cutlery, and scientific instruments of all kinds.

How they compared in manufacturing

1. In metal goods and textiles

The textile industries were likewise highly developed. While Germany produced no cotton, neither did England; and while her native supply of wool was much less than that of the English, as indicated in Fig. 306, wool could easily be imported. Her supply of flax for linen, also, was small in comparison with that of Ireland (Fig. 370); but the principal source of the world's supply, Russia, was near at hand.

© *Keystone View Co., Inc.*

Fig. 337. — A German potash mine

Near Stassfurt (Fig. 502) are immense deposits of potash and various salts. The potash is valuable as a fertilizer. The other salts are used in the manufacture of soap, explosives, glass, matches, and fireworks.

The men in the picture are working 3,000 feet below the surface of the earth.

The fact that about one half of the entire population was dependent upon mining and manufacturing for a livelihood indicates how important these industries were. Naturally, the harbors of Hamburg, Bremen, Kiel, Stettin, and Danzig were the chief places for shipbuilding. Locate these. Yet, since the source of power for manufacturing was coal, the position of the coal mines determined the location of the leading manufacturing centers. The busiest section was the so-called Ruhr district along the Rhine near Cologne. Name the more important cities in that district (Fig. 310), which may be compared with north central England in the extent of its industries. A second center lay west of the upper Rhine, in the region where Strasbourg is the principal city (now restored to France). A third was the section including Dresden and Chemnitz; and a fourth was in and about Breslau, in the southeastern corner of the country. Find these four sections on the map. In each of them at least several of the industries above referred to were carried on near one another, being drawn together by the need of fuel.

2. Location of leading manufacturing centers

3. Kinds of manufacturing important in Germany but not in Great Britain

One of the more important industries, not prominent in the British Isles, was work in wood. The supply of lumber from the extensive forests permitted considerable wood carving and manufacture of furniture, paper, and other articles made of wood. Two other important industries were the manufacture of beverages and of beet sugar. The Rhine wines had become noted throughout the world; and beer, in the production of which barley and hops were used, was made in great quantities. The British Isles, on the other hand, raise no grapes, and grow much less barley than Germany.

In the production of beet sugar Germany surpassed the world. We have already seen (p. 142) how until recently nearly all sugar was obtained from sugar cane; and how European chemists were especially active in the effort to obtain it from beets, to develop them until they contained more sugar, and to improve the process of extracting the sugar. The cool climate of Germany encouraged the cultivation of beets; so, also, did the density of the population. Formerly Germany had to import all her sugar; but with the growth of this industry beet sugar not only supplied all the home needs, but became one of the chief exports. This was another industry that was undeveloped in Britain. The manufacture of silk was still another, although the raw silk had to be imported from France and from the Orient.

The advance of manufacturing had been so rapid in the generation just preceding the war that Germany had come to rank next to the United States and Great Britain in this respect.

Effects of the war upon Germany. — As a result of the war many penalties have been imposed upon Germany that affect her industries very seriously. For example, her boundaries have been modified, with grave consequences. Fig. 331 shows these changes. Note that the section west of the upper Rhine that formed the southwestern part of Germany, *i.e.* Alsace-Lorraine, is no longer included in Germany. About fifty years ago this region, having an area and population a little larger than our state of Connecticut, had been seized by Germany; according to the treaty of peace in 1919 it was restored to France, its former owner.

© *Brown Bros.*

Fig. 338. — Deich Street, Hamburg

This is a view of an old portion of Hamburg, now devoted to the wholesale business. It is intersected by many canals, along which goods are conveyed by lighters to and from the warehouses. Over sixty bridges span the canals and many steam ferries cross them.

Losses of territory and population

1. Losses on the western boundary

Just north of Lorraine is a small area, called the Saar Basin, that is noted for its coal mines. The principal coal mines of France, near the Belgian border, were as nearly as possible destroyed by the Germans during the war with the purpose of crippling France as a competitor. In payment for such wanton destruction the mines of the Saar Basin have been given to France.

© *Underwood and Underwood*

Fig. 339. — The great shipyards at Stettin, Germany

Locate Stettin on Fig. 310. The river has been dredged so that the large vessels launched here can reach the ocean. Most of the steel used here comes from the Essen region near the Rhine or is made at Stettin from Swedish ore brought by boat from near the head of the Baltic Sea.

The Grand Duchy of Luxemburg was not a part of Germany; but it had entered into a trade agreement with that country which gave Germany many rights over it. These have been canceled and Germany now has the same relation to Luxemburg as to other countries.

Belgium has gained a small area shown on its eastern boundary. Another small section next to Denmark, taken during a previous war, has been restored to that country, since the inhabitants are more Danish than German. Note both these sections on the map (Fig. 331).

On the eastern side of Germany, changes have been made that are of the greatest importance.

2. Other losses

Many thousands of square miles have been restored to Poland. Most of this territory had been seized when Poland was forcibly divided among its neighbors more than 100 years ago. The leading city which Germany has thus lost is Posen; before the war this had a population of 150,000. Observe that this area is more than 200 miles long and averages about 100 miles in width.

Danzig, which had been one of the leading German ports on the Baltic, has also been taken from Germany and

© *Brown Bros.*

Fig. 340. — Cologne

Cologne Cathedral, dating from 1248, with its twin towers 510 feet high, is one of the finest works of architecture in the world.

declared a free city. It was, long ago, under the protection of Poland, and is now closely associated with that country, since it forms Poland's principal outlet to the sea. These changes have deprived Germany of the exclusive control of the lower Vistula River, which had been very valuable to her. They also leave the northeastern part of Germany in a very awkward position, for it is entirely cut off from the rest of the country.

In addition to all these modifications of her own boundaries, Germany has been deprived of all her colonies (p. 452).

© Underwood and Underwood

Fig. 341. — Luxembourg

A steep cliff divides Luxembourg into two parts: Oberstadt (the upper city) is built on a rocky plateau, and Unterstadt (the lower city) is in a narrow valley, nearly 600 feet below.

Thus, according to the treaty of peace, Germany has lost not less than a sixth of her population and nearly a sixth of her area. This is entirely apart from the loss of her foreign possessions.

© Underwood and Underwood

Fig. 342. — Danzig

The Mottlau River, which joins the Vistula about four miles above its entrance into the Baltic Sea, runs through Danzig and divides the older part of the city from the newer. This view is of the older portion, which has many tall, gabled houses quaintly ornamented.

Effects of these losses upon her industries

What have been the effects of these losses upon her industries? They are far greater than they might at first appear. Much of the territory given up is especially fertile land. Alsace-Lorraine is noted also for its textile manufactures. Cotton, linen, and silk goods are all manufactured there on an extensive scale.

The most serious losses, however, concern coal and iron ore. Aside from the coal of the Saar Basin, a large amount had been mined in Alsace-Lorraine and in the ter-

ritory surrendered to Poland. In all, about one third of the entire coal supply of Germany has been taken from her. But, what is still more serious, she has been deprived of about three fourths of all her iron ore — the proportion which had come from Alsace-Lorraine. It is quite probable that Germany would never have undertaken the war had she not had the mineral resources of Alsace-Lorraine, particularly its iron ore, to draw upon.

© Brown Bros.

Fig. 343. — The Rhine

The Rhine River ranks as the most picturesque stream of Europe. It flows for a long distance between high, rugged hills topped with imposing ruins of old German castles.

The difficulties of governing the country have also increased. Before the war Germany was an empire, the Emperor being a ruler of almost absolute authority. Now the nation is a republic, the highest officer being called President as in our own country.

Changes in her government

The capital is at Berlin, as before; but the change has been a violent one, with which no doubt very many of the inhabitants are not yet sympathetic. The mass of the people have not been trained to republican ideas; and their many losses from the war, together with the burden of a vast war debt and their bitter disappointment on learning the true results of the war, at first caused widespread discontent.

One thing that makes their situation especially difficult is the character and great variety of the twenty-five separate states that compose the nation. Four of these were formerly kingdoms, six grand duchies, five duchies, seven principalities, and three free cities. Prussia, which was one of the kingdoms, is larger in both area and population than all the other twenty-four together. Equal rights cannot easily be provided where the conditions vary so greatly. Despite these difficulties, there has been a stable government since 1918.

The prospect for progress. — Germany has lost her former rank among the nations of the world. Yet she is still a great nation, with important advantages besides those already mentioned. For example, her position is superior to that of England for European trade, for she is bordered by ten different countries. What are they? On account of this central position most of the markets of the continent are near at hand, while her two principal ports, Hamburg and Bremen, face Great Britain and the Atlantic Ocean.

Natural advantages for commerce

Her rivers greatly improve this advantage by furnishing water transportation for most sections of the country. This means of carrying freight is far more extensively used in Europe than in America. The most important river of Germany is the Rhine, but the

Elbe and Oder carry large quantities of merchandise. The Danube in the south is also of some importance, connecting southern Germany with the nations of southeastern Europe.

How these advantages have been improved

The Germans have not only greatly improved these rivers for navigation, but have connected them extensively by canals. By examining Fig. 310, show how boats can go from any one of these rivers to another. What advantage can you see in the Kiel Canal south of Denmark? Why would you not expect the Baltic ports to be as important as those on the North Sea? What reasons can you give why Hamburg is by far the most important port?

© *Brown Bros.*

Fig. 344. — The Kiel Canal

The Germans put off their attack on the nations of Europe until the completion of this canal. Can you see why? What island, when fortified, controls the western entrance?

Practically all the large cities have water transportation. Show that this is true in the case of Berlin; Cologne; Dresden; Breslau; Bremen; Frankfort. The great importance of the Rhine for transportation is suggested by the number of large cities upon or near it. Count and name them. What other important facts can you recall, however, that have helped to determine the location of these cities?

The Germans have been no less active in the construction of railways. In proportion to its area, Germany has greater mileage than any other country in the world except Belgium and Great Britain. In Fig. 287 note how one can go by rail from Hamburg through Berlin on to

Fig. 345. — The Isar River, near Munich

This river runs down from the Alps into the Danube. It is of little use for traffic, for the channel is choked with sand. In southern Germany there are many mountains and much of the surface is too rough for agriculture.

Prague, Vienna, Budapest, and Constantinople. You will learn more about this route later (p. 380). On what other trunk lines is Berlin located? What other cities in Germany approach Berlin in importance as railway centers? What peculiar advantages do you see in the location of Munich? Of Frankfort?

All these advantages for commerce, together with those already mentioned with regard to agriculture and the minerals necessary for manufacturing, assure for Germany an important place among the nations, in spite of her recent losses.

The ability of the German people

The ability of her people gives further guarantee of progress. Some of the ways in which they have shown enterprise have already been described. Their investigations in chemistry have made them leaders in that field. They were among the first to make a careful study of forestry and to practice conservation in regard to their forests. They have been distinguished above most other peoples for thoroughness in whatever they undertook; and the mark "Made in Germany" had become a guarantee of quality.

Germany already shows signs of recovery from the terrible check to her progress and is regaining her prosperity more rapidly than most of her neighbors. The terms of the treaty of peace have been made less severe and in 1926 she was admitted to the League of Nations.

Facts to be especially well fixed. — 1. The names and location of the countries and waters surrounding Germany. 2. Principal surface features. 3. The temperature and rainfall conditions of Germany. 4. The courses of the chief rivers. 5. Location of cities having a population of more than 500,000 (see Appendix). 6. Principal losses of territory following the war. 7. Chief farm products.

Problems for independent study. — 1. Find out the uses of zinc. 2. Make a comparison between the Rhine and the Hudson rivers in importance for transportation. Whitbeck, R. H.: *High School Geography*, pp. 163–170, 344–346 (Macmillan); Allen, N. B.: *Industrial Studies: Europe*, pp. 169–172 (Ginn); Chamberlain, J. F., and Chamberlain, A. H.: *Europe*, rev. ed., Chapter VI (Macmillan). 3. Compare the same two rivers with regard to the beauty of their scenery. Carpenter, F. G.: *Europe*, Chapter XXXIV (American Book); Herbertson, A. J.: *Descriptive Geography of Europe*, pp. 68–69 (Macmillan). 4. Learn what you can about the importance of navigation on inland waterways in Germany. 5. Explain when and why land sloping to the north is likely to have a cooler temperature than land sloping to the south. 6. Make an outline map of Germany, showing surrounding countries and waters and the location of the leading rivers and cities. For a description of the cities, see Herbertson, A. J.: *Descriptive Geography of Europe*, pp. 59–89.

4. Switzerland

Disadvantages of its location. — The small country of Switzerland is one of the few prominent countries without a seacoast, being entirely surrounded by other nations. Name the four countries which border it. Switzerland has to depend upon these countries for routes by which to import raw materials and to send her products to the world markets. If goods are sent south across Italy to the port of Genoa, they must travel overland a distance nearly as great as from New York to Boston; while if they are sent southwest through France to the Mediterranean, they must go about twice that distance. Test these estimates of distance. The Rhine River in the north affords an outlet to the North Sea. Though this is the longest route, it is nevertheless the most important outlet. Can you explain why? Besides the distance

Character of surroundings

from the sea, what are some of the other difficulties involved in dependence upon foreign countries for an outlet?

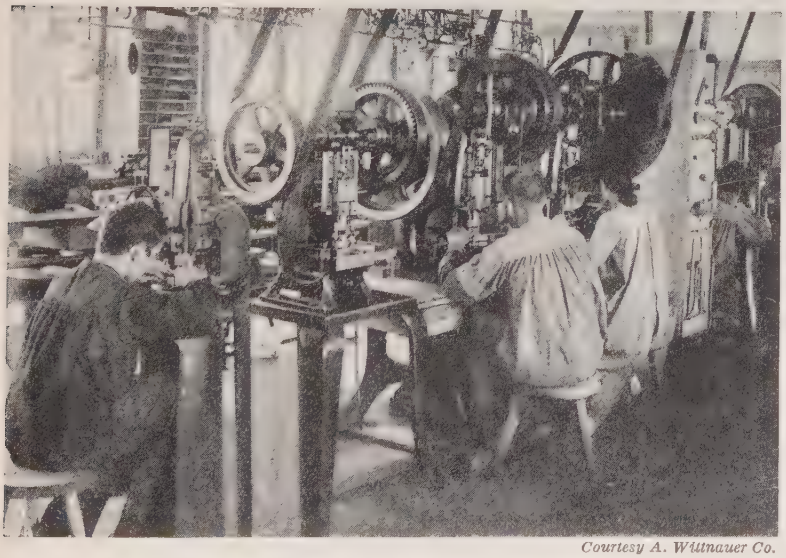
Some effects of these surroundings on the people

As a result of its location, Switzerland has no common language of its own; the people have adopted the languages of the countries which surround it. It is most open toward the north, for there the Swiss plateau merges into the German plateau (Fig. 310). Naturally, therefore, German influence has spread into Switzerland; most of the people occupying that section are of German stock and about two thirds of the Swiss speak German. In Fig. 310 locate Zurich and Basel, two of the important cities in German-speaking Switzerland. Name, in Fig. 310, the mountain ranges which form a serious barrier on the west and south. Since the entrance from France and Italy is much more difficult than that from Germany, the French-speaking population, centering about Geneva in the southwest, forms only about a fifth of the whole, while the small remainder is mainly Italian. Is it an advantage or disadvantage for a country to have no common language? Why?

© *Feature Photo Service*

Fig. 346. — A peasant's hut in the Alps, Switzerland

In the highlands of Switzerland almost the sole industry is the raising of live stock. The pasture lands are so close to the snow line that the trees in them are of a dwarfed variety.



Courtesy A. Wittnauer Co.

Fig. 347. — Making watches in Switzerland

Swiss watchmakers have long been noted for the excellence of their workmanship. Probably no other country excels Switzerland in the manufacture of watches of all kinds from the cheaper grades to the finest. Try to find an advertisement of a Swiss watch.

The Swiss have also been influenced by the political ideas of their neighbors. For instance, during the World War German-speaking Switzerland was mainly German in its sympathies. How would you expect the Rhine to act as

a factor in influencing Switzerland in that direction?

How these disadvantages of location have been overcome. — From these facts, one might expect Switzerland to be a weak nation and the inhabitants of the different sections to have little in common with one another. However, the disadvantages of location have been largely overcome by the excellent transportation routes.

Nature of the transportation routes

The difficulty of building roads and railroads in so mountainous a region has led the people to put forth special effort and to build only the best. Few countries in the world have better highways than Switzerland. In some respects the mountains have not been as great obstacles as might be expected, for the numerous passes at the divides between the headwaters of river valleys make it possible to cross mountain ranges at comparatively low altitudes. In many other cases, where no easy passes are to be found, tunnels have been cut through the solid mountain walls. While few of the rivers are navigable because of rapids and the swiftness of the currents, the numerous large lakes are important aids to transportation. Thus transportation routes of various kinds cross the country in all directions, keeping the different sections in close touch with one another and affording communication with foreign countries.

© *Underwood and Underwood*

Fig. 348. — The St. Gothard Railway

This view shows how the St. Gothard Railway ascends the mountain side, with many curves and trestles, to a height of 3,786 feet. The train shown on the upper loop is at the mouth of one of the famous "spiral" tunnels.

One of the most important railroads is the St. Gothard Railway, which crosses Switzerland from Basel on the German border to the Italian border and continues on to Genoa. Trace it on the map (Fig. 310). It is part of one of the greatest traffic routes in the world, that from the Orient to the North Sea countries. The St. Gothard Tunnel here pierces the Alps to connect Switzerland with Italy. Locate it in Fig. 310. It is one of the longest tunnels in the world, being more than nine miles in length, and is a marvel of engineering skill. Before reaching the main tunnel, in traveling north, one passes through several smaller ones through which the train winds in a circular course. The train twice emerges from the mountain almost directly over the point where it entered. Such winding tunnels are necessary because the slope is so steep that a train could not be drawn directly up a straight track.

Some of the most noted railways

The Simplon Pass Railroad follows the Rhone Valley from Geneva to the Po Basin. The Simplon Tunnel pierces the Alps a short distance west of the St. Gothard, and is

even longer than that tunnel, being more than twelve miles long. The Mt. Cenis route, through the Mt. Cenis Tunnel, is the one generally followed from Paris to Rome.

Factors that have aided independence. — In some ways Switzerland's position has helped to preserve its independence. The mountainous surface has made it a stronghold easily defended against invasion. The Alps and Jura ranges make the approach from Italy and France exceedingly difficult; the narrow passes and tunnels, the only means of entrance, can be held by a mere handful of men against an army. As early as 1291 an agreement was made among a few of the small states, or *cantons*, of Switzerland to unite for protection. Many a time since then other nations have tried to conquer the Swiss; but by fortifying themselves in their mountain strongholds they have been able to maintain their freedom.

Influence of the mountainous surface

© *Underwood and Underwood*

Fig. 349. — The principal street in Bern

Among the chief characteristics of Bern are its numerous old fountains, ornamented with curious statuary. The picture shows the sculptured figure of a bear, long used as the emblem of Bern on its public buildings.

Its location in the midst of powerful neighbors makes Switzerland a good buffer state, like Belgium and The Netherlands (p. 338). As in their case, none of the nations bordering Switzerland wants any one of the others to have the advantage of possessing it, and they have therefore agreed to respect its independence. At the same time, it is too small a nation to be feared by its neighbors; its area is only about a third as great as that of New York State; and while it is more densely settled than that state, its population of nearly 4,000,000 is not large enough to be dangerous. Compare its population with that of the nations on its borders. How must its dependence upon those countries for its contact with the sea influence its relations with them?

Its value as a buffer state

The kind of government resulting from such influences. — People who dwell among mountains develop a spirit of independence that is well illustrated by the story of William Tell. Do you remember this story? In spite of the conflicting influences of the French, the Germans, and the Italians, the Swiss people are strongly united and their government is independent of any of these nations. Their twenty-five cantons, joined somewhat as are our states, now form a republic which is one of the most perfect democracies in the world. In Fig. 310 locate Bern, the capital. How would you expect the smallness of the nation to strengthen the government?

How the physical conditions have affected the occupations. — Owing to the mountainous character of the country, only one acre in nine is fit for the plow; the temperature conditions, of course, differ greatly according to the altitude. Agriculture, the leading occupation, is therefore carried on mainly in the valleys. The section best suited to it is the central plateau or plain that extends from Lake of Geneva to Lake of Constance, flanked on one side by the Alps and on the other by the Jura Mountains. Locate it in Fig. 310. It forms a strip about 160 miles long and 30 miles wide, and includes a third of the area of the country. Grains, potatoes, garden truck, and grapes are grown here. Not enough crops are raised, however, to supply food for the dense population, and grains, vegetables, and fruits must be imported.

Why farming is prominent in spite of disadvantages

© *Publishers' Photo Service*

Fig. 350. — A valley in the Alps, Switzerland

Very little of the surface of Switzerland is suitable for agriculture. Note how well the valley flats are tilled. The lower mountain slopes are forested. Why are there no forests on the upper slopes and the tops of the mountains? Above the forests are excellent summer pastures called *alps*.

Far more important than these crops is dairy farming, to which the country is especially adapted. On the lower mountain slopes grass springs up after the melting snows in the spring and furnishes excellent pasturage for cattle, sheep, and goats; and, as the snow line recedes up the mountain slopes with the advancing season, the animals are driven higher and higher into pasture lands known as *alps*. The dairy industry is widespread and steadily increasing. Condensed milk, butter, and cheese are the chief food products; the export of these materials is great enough to pay for much of the food that must be imported. Can you see why fresh milk is not the chief export of the dairies?

Its next most important occupation, the entertainment of tourists, Switzerland owes to the wonderful scenery of the Alps, which is hardly surpassed by that of any other region in the world. Many of the Swiss cities and towns are beautifully situated upon lakes at the foot of mountain peaks that are always covered with snow. Geneva, on the beautiful lake of the same name, is much visited by tourists. Lucerne, also situated on a lake, is surrounded by lofty mountains. Mounts Rigi and Pilatus, near by, afford beautiful views of the surrounding ranges. An especially famous peak is the Matterhorn, in southern Switzerland.

Beauty of the scenery

© Publishers' Photo Service

Fig. 351. — A portion of Vevey, Switzerland

Vevey is a city on the Lake of Geneva much visited because of the beauty of its scenery. Locate this lake in Fig. 310.

What interesting things could you find to do as a tourist in such a country?

On account of this scenery, Switzerland is the most noted summer resort in the world. Probably as many as 3,000,000 tourists visited Switzerland annually before the war. Large numbers of persons earn their livelihood by keeping hotels and boarding houses. Nowhere in the world are there better accommodations for tourists.

Advantages for manufacturing

The absence of coal, ore deposits, and cotton would suggest that there is little manufacturing; but this is not the case, for Switzerland has become an important manufacturing nation. Although coal is wanting, there is abundant water power, supplied by the swift mountain streams that are fed by the melting glaciers. The Swiss are taking a leading place in the use of such power. They are likewise unusually skillful mechanics. They have long been noted for their remarkable wood carving, and Swiss watches are known the world over. Manufacturing in Switzerland receives encouragement from its central position; for it is surrounded by densely populated countries which supply raw materials and furnish an unlimited market for manufactured goods. Finally, the extensive transportation systems already mentioned make it possible to import and export goods easily.

A large part of the manufacturing is done on the central plateau, where most of the important cities are located. What advantages for manufacturing would you expect this section to have over the rest of Switzerland (Fig. 310)? Zurich, the largest manufacturing center, is also the largest city of Switzerland. It produces silk, cotton goods, embroideries, and other textiles. Basel, the second largest city, manufactures silk ribbons and other goods. How is its position, near both France and Germany, also favorable to metal manufactures? The third city in size is Geneva, where watches, jewelry, and scientific instruments are made. Trace in Fig. 287 the railroad connections of these three cities with other European countries. Dairy products are extensively manufactured in many of the smaller cities; Swiss cheese, condensed milk, and milk chocolate are among the chief food products that are exported. What explanation can you suggest for the manufacture in Switzerland of products from the cacao bean?

Leading manufactures

© *Keystone View Co., Inc.*

Fig. 352. — Geneva

In the new building on the left of the center of the picture are the offices of the League of Nations (p. 381). See also Question 7 on this page. Name at least one other city visited by delegates from many nations.

Facts to be especially well fixed. — 1. The advantages and disadvantages of Switzerland's position. 2. Names and location of two chief cities on the German side, and one on the side next to France. 3. Names and location of two other prominent cities. 4. Countries surrounding Switzerland. 5. Principal occupations.

Problems for independent study. — 1. How do the conditions for manufacturing in Switzerland compare with those in New England? Winslow, I. O.: *Europe*, pp. 119–120 (Heath); Chamberlain, J. F., and Chamberlain, A. H.: *Europe*, rev. ed., Chapter XVIII (Macmillan); Adams, C. C.: *A Textbook of Commercial Geography*, pp. 271–275 (Appleton). 2. How many languages would a member of the Swiss Parliament need to know? Why? 3. Why is particular attention given to the study of English and other foreign languages in the Swiss schools? George, M. M.: *A Little Journey to Switzerland*, p. 7 (Flanagan); Carpenter, F. G.: *Europe*, p. 269 (American Book). 4. Why has Switzerland not come into possession of colonies? 5. Find out where Louis Agassiz was born, where he lived, and what he did to prove his theory of the Great Ice Age. See any encyclopedia on *Agassiz*. Also George, M. M.: *A Little Journey to Switzerland*, p. 19. 6. Many of the Swiss railroads are being electrified. What advantages has Switzerland for this? How will such electrification make Switzerland less dependent upon other countries? 7. Why should Geneva be chosen for many international meetings, such as those of the Red Cross, the League of Nations, and labor organizations? 8. Why is Switzerland often referred to as "The Playground of Europe"? Carpenter, F. G.: *Europe*, Chapter XXXV (American Book); Finnemore, J.: *Peeps at Many Lands: Switzerland* (Macmillan).

5. Belgium, The Netherlands, and Denmark

How the location of these countries affects their importance. — These small nations lie on the main outlets from central Europe and Russia to the countries on the Atlantic; they have, therefore, become exceedingly prosperous and important. The chief ports in Belgium and The Netherlands are connected by rail with the chief cities of the continent. Most of the exports from the rich Rhine Valley leave The Netherlands through Rotterdam or Amsterdam, while a portion of the goods from Baltic ports is transshipped at Copenhagen. Locate these cities.

Advantage of their position for trade

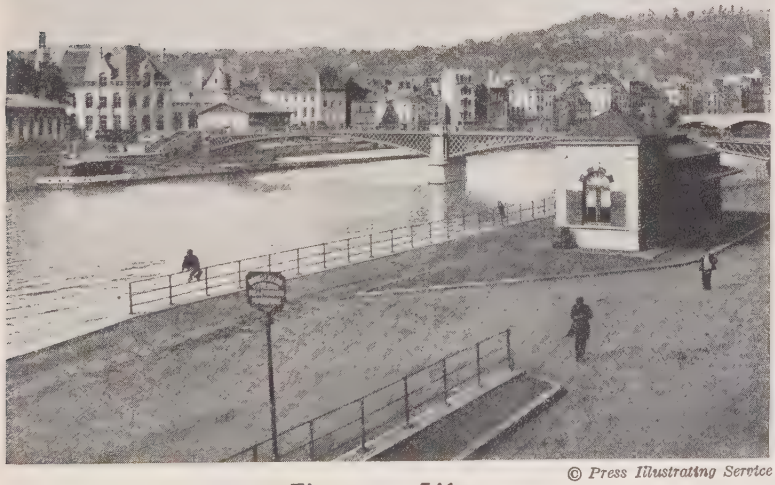
© *Press Illustrating Service*

Fig. 353. — The beach at Ostend

Ostend is one of the most popular summer resorts in Europe. The wide Digue, the promenade beside the sea, is noted for the beautiful buildings bordering it. In the World War, Ostend was used as a German base for submarines and destroyers.

In addition to the advantages of handling the traffic that passes through them, these countries enjoy unusual opportunities for collecting raw materials and marketing their own products. Their position on a low, practically level plain has made it especially easy for them to provide transportation within their own limits. Canals are almost as common as roads; and many of the rivers have been widened and deepened for navigation. In The Netherlands alone there are more than 2,000 miles of navigable waterways. The railroad mileage, also, is large for such small countries. Consequently, goods can be transferred cheaply between any points within their borders.

The ease with which raw materials can be collected and products marketed



© *Press Illustrating Service*

Fig. 354. — Liége

The river Meuse, famous for the many hard battles fought along its banks, divides the older and newer parts of Liége. What brave part did Liége play in the World War?

At the same time foreign markets for both foods and

© Press Illustrating Service

Fig. 355. — Amsterdam

Amsterdam is a network of canals, which cut up the city into ninety islands, connected by 300 bridges. The houses you see in the picture, as well as all other buildings of the city, are built on piles driven into the sand.

manufactured products are always near at hand. Name some of these markets. Direct steamship lines, moreover, lead from their excellent harbors to their colonies, as well as to England and America.

How their position has helped them to remain independent

Although they are surrounded by powerful neighbors and have no natural boundaries except the sea, the position of these small countries has helped greatly to keep them independent. For example, since the country which controlled Denmark could also control the outlet from the Baltic Sea, neither Russia nor Germany has been willing for the other to hold it. England's desire to maintain a barrier between herself and Germany has encouraged her to aid in preserving the independence of The Netherlands. In fact, the great nations of Europe have even gone so far as to sign an agreement to protect Belgium and Luxemburg in case any nation made war upon them.

The advantage to France in having Belgium between it and Germany became very evident in the World War. As we have seen (p. 307), Germany planned to defeat France before she could get her armies ready, by sending forces through Belgium instead of by the shorter but more mountainous route through Alsace and Lorraine (Fig. 310). The Belgians, however, resisted, and while the Germans were fighting their way past Liége, Namur, and other fortified Belgian cities, France had time to prepare herself for attack.

Photo by Elmendorf © *Ewing Galloway*

Fig. 356. — A dike in Holland

Notice the network of piles to withstand the force of the waves.

Thus the desire of the great nations to have small countries between them and their rivals has kept these weaker nations

from being absorbed by their stronger neighbors. Countries in such a position as these three are called *buffer states* (p. 333). By acting as checks or buffers they tend to prevent war.

The menace of the sea to the low coastal regions. — Fig. 310 shows the elevation of Belgium and The Netherlands. Estimate the proportion of The Netherlands below sea level. Is this the largest area in Europe below sea level (Fig. 286)? Netherlands means *low country*, and Holland, properly the name of the low western portion but often used to refer to the entire country, means *hollow land*. If it were not for the sand dunes along the coast and the many dikes built by the Hollanders, a large part of The Netherlands would be under water at high tide. There is constant danger from leaks and breaks in the dikes, which must be watched day and night. What does Fig. 310 tell you about the elevation of Belgium?

Fig. 357. — A windmill on one of the canals of Rotterdam, The Netherlands

For what large river is Rotterdam the port?

How the lowlands are protected from floods. — It is interesting to study the way in which the low land is reclaimed from the sea. Embankments, or *dikes*, are built around the area to be reclaimed, which is called a *polder* after the water has been pumped out. The dike may be as much as 300 feet thick and thirty or forty feet high. Ditches are dug through the polders to drain them and one often sees canals extending along the tops of the dikes to carry away the water as it is pumped from the polders. Such canals are also used for transportation. After the water has been removed, the layer of decayed vegetable matter is scraped off the polder and the fertile soil is exposed.

How land below sea level is reclaimed

Continual pumping is necessary in many places to keep the polders from being filled with water again. In other localities the polders drain themselves through ingeniously arranged gateways at low tide. Since the polders are below sea level, there is almost constant seepage through the dikes; rain water also adds to the difficulties, for in Holland there are over 200 rainy days a year. What is the rainfall in inches (Fig. 291)? The necessity for constant pumping,

© Press Illustrating Service

Fig. 358. — A general view of Brussels

This city is noted for the number of its beautiful old buildings. The Church of St. Gudule is shown near the center of the picture. In the World War, the headquarters of the German governor-general were here.

however, is not the drawback that it might at first seem. Different crops require different amounts of moisture in the ground. Thus, the farmer can have the amount that will be best for a given crop simply by regulating his pumps. Can you see how the Hollander has in this respect an advantage over the American who has to depend on the rain alone for his moisture?

Windmills were formerly the only means for such pumping, and many are still in use (Fig. 357); but now steam pumps are also common. There are many hundreds of miles of sea dikes in Holland; some idea of the force they have to resist may be gained by standing behind one of them during a storm and listening to the fierce beating of the ocean waves on the opposite side, several feet higher than one's head. The embankments inclose houses, gardens, and fields, much as fences or stone walls inclose houses and gardens in other countries. They are so numerous that they extend over the lowlands in a great network.

Both Holland and Belgium have another difficulty where the rivers cross the lowlands. Embankments must be built to keep them from flooding the land, especially during times of high water. As you travel up the river from Rotterdam you occasionally see housetops and church spires, but most of your view is cut off by the embankment, just as it is when you are passing through a railroad cut.

The difficulty caused by the rivers, and how it is overcome

© Keystone View Co., Inc.

Fig. 359. — Ghent

The Cathedral of St. Bavon, founded in the tenth century, shown in the center of the picture, and the turreted church of St. Nicholas in the background, are two of the oldest buildings in Ghent.

What river in the United States does this description recall?

Differences in the occupations of these countries. — Only a small fraction of the people of Belgium and Luxemburg make farming their principal occupation. The explanation for this small proportion of farmers lies in the fact that the southern parts of Belgium and Luxemburg contain valuable deposits of most of the minerals upon which modern industry depends. Can you name some of these? It is not surprising, therefore, to find the people engaged in mining or manufacturing.

Why manufacturing is of first importance in Belgium

The occurrence of iron ore and limestone near the coal deposits (Fig. 288) is a great advantage to the iron and steel industry. Why? Liége is the center of a district where guns and munitions are made; and locomotives, rails, and heavy machinery are manufactured at Charleroi and Mons (Fig. 502). Can you see in these facts one of the reasons why the Germans chose this route to France at the beginning of the World War?

While the minerals of Belgium are near the French boundary, the ease with which machinery and coal can be transported throughout the country has caused a wide distribution of manufacturing plants in northern Belgium. Brussels, the capital, is celebrated for its lace and carpets. Ghent and Tournai are centers for the manufacture of linen and cotton goods. Locate these on Fig. 502. Bruges and Ypres were once noted for the manufacture of woolen goods; but the filling up of the rivers which connected them with the sea has robbed them of much of their importance, although attempts are now being made to dredge the channel to Bruges.

Antwerp, with one of the best artificial harbors in the world, is the port from which most of the goods of the country are exported. It is also an important manufacturing center, coal having been discovered near it. Rubber and other raw materials from the Belgian Congo are sent to Antwerp to be refined.

© *Brown and Dawson*

Fig. 360. — Canal boats in the harbor at Antwerp

Antwerp is located about fifty miles from the sea on the Scheldt River. Its new docks and quays were completed in 1905; the harbor is now deep enough to accommodate the largest ocean vessels. From Fig. 310 determine what inland waterways can be reached from Antwerp.

In spite of the facts that Belgium is the most densely populated country in Europe and most of its people are engaged in manufacturing, it produces a large proportion of

the food it requires. The excellent transportation system permits many of the factory workers to live in the country, where each has his own garden. By careful working large yields of oats, rye, flax, and potatoes and many root crops are produced in the north, and wheat and sugar beets in the south.

The surprising amount of food produced in Belgium

Goods from the Rhine Valley are transferred from river boats to ocean steamers at Rotterdam and Amsterdam, and incoming goods are transferred to the river boats. This transshipment provides employment for thousands of people and brings profits to many others in the form of warehouse charges and commissions. The extensive trade with Germany and Switzerland might bring in great returns to the Dutch Government if a duty were charged, as in most other countries; but the Dutch believe that they can reap greater profit by permitting goods to pass through the country without charging such a tax.

The occupations of the Dutch

1. Importance of transportation at Rotterdam and Amsterdam

Another important occupation in the cities is the preparation for market of products from the colonies as well as from the homeland. Because of their nearness to the water, there has always been a large number of expert sailors, who have taken an important part in exploration and in the founding of distant colonies. Their attempt to take possession of the Hudson Valley was checked by the English; but the Dutch colony of Guiana in South America has already been mentioned, and they also hold the large and important islands of Java, Sumatra, Celebes, and many others in the East Indies. Cane sugar, coffee, and spices from these colonies and beet sugar and dairy products from the home country are refined and packed for export.

2. The leading kinds of manufacturing

The demand for tile to be used in their draining projects, as well as the lack of lumber for building purposes, has led to extensive manufacture of tile, brick, and pottery from clays deposited by the sluggish rivers. Large quantities of pottery are sent to America from Delft and The Hague. The Dutch cities were famous years ago for their textile manufactures, but the necessity of importing their coal has caused this industry to decline.

© *Underwood and Underwood*

Fig. 361. — Milking time in The Netherlands

In The Netherlands there are nearly as many dairy cows as in New York, although the country is only about a fourth as large.

The farming is done on small plots. More than half the farms contain less than two acres. How does that compare with the average farm in France (p. 312)? Because of the smallness of the farms, farm machinery is not usually needed in these countries.

3. Methods of agriculture, and the farm products

To a large extent, the spade takes the place of the plow, and hand labor, guided by the experience of many generations, secures large crops of the best quality. These are similar to those of Belgium, but more land is devoted to pasturage than to farming. The higher land in eastern Netherlands is too sandy for profitable cultivation, but a certain breed of cattle thrives very well on the scanty pasture. The low, moist country in the vicinity of Amsterdam produces excellent grass; this region is, therefore, the center of a large dairy industry. Cattle, hogs, sheep, and horses are raised in great numbers. The cattle are of excellent breed, and the butter and cheese from the Dutch dairies find a ready market abroad. This is partly on account of the cleanliness of the Dutch people and their painstaking care with their products. In Fig. 305 note how extensively cattle are raised. Holland is also noted for its tulips and other flower bulbs, which are sent to all parts of the world.

© *Underwood and Underwood*

Fig. 362. — The harbor at Copenhagen

This view shows the extent of the harbor of Copenhagen, which forms the chief port and naval station of Denmark. The harbor is large enough to accommodate the whole Danish fleet.

Why Denmark specializes in the production of food

Denmark has no rich deposits of coal and iron like those of Belgium. It also lacks the advantageous position of The Netherlands for transportation, not only because the commerce of the Baltic is less than that of the Rhine, but also because only a small part requires transshipment at Copenhagen. Consequently Denmark is chiefly an agricultural country.

Neither corn nor wheat grows well in Denmark, but the moist, cool climate is well adapted to the growing of hay and fodder. Dairying and stock raising have therefore come to be of first importance. The large surplus of milk resulting from the manufacture of butter and cheese furnishes a cheap and fattening food for swine, which in turn gives rise to a large pork industry (Fig. 336).

Coöperative societies have been formed by the Danish farmers to enable them to make their labor more productive and to market their products to the best advantage. People from all over the world go to Denmark to study the excellent methods of dairying. The government inspects and grades the products, thus insuring uniformly good quality. The excellence of the goods has won a high place in European markets for Danish butter, cheese, eggs, and bacon. Most of the exports go to Great Britain, but in the winter of 1919–1920 the price of butter in America went so high that Danish butter was sent to New York at a profit.

As in The Netherlands, most of the manu-

facturing consists of the preparation of foodstuffs for market. There are scores of factories for the production of oleomargarine, beet sugar, and pork products.

The favorable location of Copenhagen. — Copenhagen (meaning *merchants' harbor*) is the capital and only large city, as well as the industrial center, of the country. Since Denmark, like Belgium and Holland, has a large trade with Great Britain, one might expect to find an important seaport on the western coast; but that coast is so low and so shut in by sand bars that good harbors are lacking. Copenhagen is, in fact, the only harbor in all Denmark that large vessels can enter. It is located on Zealand Island, at a point which guards the entrance to the Baltic Sea.

The importance upon the sea of these three nations. — Since all three of these nations border the sea and are located near some of the best fishing grounds of the world — the North Sea — they engage extensively in fishing. We have already seen how successfully Holland has competed with the great nations of the world in exploring the earth and establishing colonies, and we have referred to the extensive possessions of Belgium in Africa. Denmark has been less successful in this respect, her only foreign colony at the present time being the very large but almost uninhabited island of Greenland. The Faroe Islands, north of Scotland, are considered not to be a colony, but rather a part of Denmark itself. Iceland (Fig. 287), though independent of Denmark, is ruled by the same king and the two governments are in other ways closely related.

Facts to be especially well fixed. — 1. The names and location of four great ports in these countries. 2. The location and importance of The Hague; Liége; Brussels. 3. The course of the lower Rhine through Holland. 4. Principal products of each of these countries.

Problems for independent study. — 1. Compare the area and population of these countries with those of some of our states of similar size. 2. Follow the route taken by Germany in the World War in the invasion of Belgium and find how much of Belgium she overran. 3. What languages are spoken by the peoples of these three countries? What other peoples are most closely related to the Danes? 4. In what important respects are Iceland and the Yellowstone National Park alike? 5. Hans Christian Andersen was a native of Denmark. What stories that he wrote do you know? 6. Why should oleomargarine be an important product from Denmark? Carpenter, F. G.: *Europe*, p. 182 (American Book); Crissey, F.: *The Story of Foods*, pp. 226–227 (Rand McNally); Whitbeck, R. H.: *Industrial Geography*, p. 428 (American Book). 7. Why should not Rotterdam be as great a city as New York? Allen, N. B.: *Industrial Studies: Europe*, pp. 171–173 (Ginn); Chamberlain, J. F., and Chamberlain, A. H.: *Europe*, rev. ed., Chapter V (Macmillan). 8. Read *Peeps at Many Lands: Holland*, by Beatrix Jungman (Macmillan); Phœbe Cary's Poem, *The Leak in the Dike*.

6. Norway and Sweden

Influences that have determined the location of the population. — What do you observe in Fig. 294 about the location of the population of Norway and Sweden? On the map (Fig. 310) note where the cities and towns of the two countries are situated. There are two factors that largely determine such location, one of which is the climate. The more northern parts of these countries can support only a sparse population on account of the cold and the winter darkness. In Fig. 495 trace the 60th parallel of latitude across the peninsula and across North America. How do Oslo and Stockholm compare with Juneau, Alaska, in latitude?

The influence of latitude

During a few weeks in early summer the sun is visible twenty-four hours each

day at the North Cape; but six months later it is not visible there even at midday. At Trondhjem the shortest day lasts from 10 A.M. to 2.00 P.M. The lakes in northern Sweden freeze over in October and remain frozen about seven months; and the northern part of the Baltic Sea is frozen over from the middle of November until May. On the higher portions of the Norwegian plateau there are large ice fields, one of which covers 580 square miles. In the southern part of the peninsula, however, the days are longer; and both there and along the coast, particularly in Norway, the temperature is more moderate. Recall how the winds and ocean currents help to lessen the extremes of heat and cold. In what temperature region is western Norway? The rest of Norway and Sweden?

The character of the surface of the peninsula has also exerted an important influence upon the distribution of the population. In Fig. 286 note the proportion of the land that is mountainous. Some peaks reach elevations of between 6,000 and 8,000 feet; but most of them are lower and rise to about equal heights, giving the uplands the appearance of a rough plateau. Along the mountainous Norwegian coast glaciers have carved deep valleys or *fiords* down to the sea, with steep cliffs of solid granite on either side. Some of these fiords are more than 100 miles long and have tributary fiords joining them at intervals. In most of Norway, therefore, transportation by land of goods or even of people is extremely difficult.

The influence of surface features

In much of Sweden transportation is easier; it is there, accordingly, that we find most of the farming and inland population of the peninsula. Yet Stockholm (Fig. 365), the Swedish capital and a prominent seaport, is ice bound three months in the year. Göteborg is very rarely icebound and is connected with Stockholm by railroad. What must be some of the difficulties of railroad transportation there in severe winter weather?

© *Rau Art Studios, Inc.*

Fig. 363. — A Norwegian fiord

The water in this narrow passage is very deep, and the height of the cliffs can be judged by comparing them with the vessel that is passing between them. The fiords are largely the work of glaciers.

How some of the most common occupations are limited by these conditions. — The most common occupations, such as agriculture, lumbering, mining, and manufacturing, are greatly limited by these conditions. For instance, less than one fifteenth of the peninsula can be cultivated, so that no large number of persons

How agriculture is limited

can be engaged in agriculture. In Norway the thin soil and moist climate greatly restrict farming. While grass will grow, the hay will not cure except with much care.

Most of the farms in Norway are found in the south and on little deltas in the fiords. Usually the fiord farms are only large enough to support one family and are far apart. Each has a few cattle, which are driven to the uplands to feed on the rich grasses in summer and back to the lowlands to be stall-fed in winter.

Fig. 364. — A hayfield on a Norwegian delta

In most parts of western Norway there is very little land for cultivation except at the deltas that are found here and there at the heads of fiords. The climate is so moist that the grass is hung over stakes or fences to cure.

Southern Sweden is the only extensive farming region. It was this section which first attracted settlers to the peninsula. Hay and fodder take up more acreage than any other crops, and the dairy industry is well developed. Swine are also raised by the same methods as in Denmark. Recall them. The principal grain is oats, which is valuable to the live-stock industry; rye, barley, wheat, and potatoes and some root crops are also grown. Yet the conditions for farming are so poor that both Norway and Sweden must import a large proportion of their food.

Nearly forty per cent of the peninsula is covered with forest, a large part of which is pine; these forests have been very profitable to the people. In some ways the cold climate aids the lumbering industry, just as it does in Maine; for the trees, after being felled and trimmed, can be drawn on sleds to the banks of streams. When these are swollen by the spring freshets from the heavy snows, the logs are floated cheaply to the sawmills at the river mouths along the coast. Large amounts of lumber are exported to other European countries that have about exhausted their supplies.

How lumbering is affected

On the other hand, the summers are so short that the growth is slow and the quantity of timber per acre very limited. Much of it, being too small for building purposes, is suitable only for pulp and paper making, which, however, is here a very important industry. Meanwhile, since the demand has been extensive, the forests have become much reduced, and the governments have had to undertake measures for their conservation. Can you suggest what some of these must be?

In most countries where manufacturing is well developed, the agricultural products supply a large share of the raw materials for the factories. Show how that has been true in France; in Germany; in our own country except the Northeastern section.

The limits on mining and manufacturing

In the Scandinavian countries, however, as in Great Britain, the scarcity of agricultural products prevents this type of manufacture.

Their principal raw material is iron ore. This is the very best in Europe, and the mining of which is one of the chief industries of the two countries. But again, it is located in the distant north (Fig. 288), where the severe climate and long, dark winters make it difficult to support any large population. In addition, there is practically no coal in either country for smelting the ore. As a substitute, however, they have abundant water power; Norway has many falls and rapids on the borders of the fiords, and almost every river that crosses Sweden to the Gulf of Bothnia has many falls and rapids that might produce power and heat.

Iron ore is the only important mineral that is extensively mined; and while coal is imported, especially by the Swedes, for the manufacture of a limited amount of machinery, agricultural implements, and other articles for which there is a local demand, most of this ore is exported. The chief purchasers are Great Britain and Germany, the high quality of the iron being especially valued at Sheffield and other places where cutlery and tools are made (pp. 291 and 326). It is exported by way of the Baltic, or sent by rail to Narvik on the Norwegian coast and thence by water. Follow the latter route in Fig. 287.

New industries have recently developed. Nitrogen is extracted from the air and is combined with a Norwegian limestone to make fertilizer; and a new method of separating aluminum from a rock found in the peninsula has been developed in Norway. It is quite possible that, by the aid of electricity from water power, these countries will in the near future be able to make extensive use of their minerals, including zinc ore, manganese (used in making a certain kind of steel), and copper.

© Keystone View Co., Inc.

Fig. 365. — Stockholm

Mälar Lake, canals, and deep streams that flow into the Baltic Sea make a network of waterways through Stockholm, dividing it into many islands and causing it to be called the "Venice of the North."

Why two other occupations are especially important

Think of the limitations that face Scandinavian children, when they must choose a life work! If they have grown up on a farm, they are likely to find that it is too small to afford them a living. If they look to manufacturing, they discover that it is not promising. Only upon the sea is there opportunity for all. Here either of two occupations is possible.

In the North Sea and off the northwestern

coast of Norway are the finest fishing grounds of Europe. Cod, halibut, and herring are abundant. Bordering the Norwegian coast is a shallow platform 500 to 600 feet below the surface and 50 to 60 miles wide, which furnishes excellent spawning and feeding grounds for fish. This region likewise enjoys the cool summer weather which always is a feature of important fishing grounds. The Scandinavians also seek fish in Arctic waters, where many are engaged in whale, walrus, and seal fisheries. More than 100,000 people are engaged in the fishing industry in these two countries. Fish and fish products comprise a third of Norway's exports. Bergen is the chief center of the industry.

1. The value of the fisheries

© *Keystone View Co., Inc.*

Fig. 366. — A portion of Bergen and its harbor

Bergen is about twenty-five miles from the open sea, on a fiord. Like most fiord cities, it has an excellent harbor. It is an important fishing center and shipping point for timber, tar, hides, and paper.

Most of us, however, would be likely to prefer the other kind of work made possible by the sea — commerce. Norway lies near the center of the commercial world and has excellent harbors on the Atlantic and in the fiords; it also has lumber easily available for building ships, and is furnished by the fishing industry with experienced seamen. So it has become a great commerce carrier. It has more ships in proportion to its population than any other country in the world. Most of this shipping is engaged in carrying goods for other countries. Sweden also ranks high in shipping, but more of its ships carry its own goods, such as exported iron ore and imported coke.

2. The importance of navigation

The extent of emigration. — Many of the inhabitants have found no occupation at home sufficiently promising, and on that account an unusual number have emigrated. In spite of the small population, over 30,000 emigrants a year were leaving the Scandinavian Peninsula before the World War. There are about a million persons born in Scandinavia now living in the United States. They are found in our lumber camps and iron mines, on our Great Lakes and our coastal fishing and trading vessels, and on our northern farms. Can you see why they have emigrated to these parts of our country and chosen these occupations? As a rule they have given a remarkably good account of themselves as American citizens.

Facts to be especially well fixed. — 1. Names and location of the capitals of these two countries. 2. The latitude of these two cities. 3. Principal occupations and products of these countries. 4. The names of the waters surrounding the peninsula.

Problems for independent study. — 1. Write a letter showing the attractions to the tourist

of a voyage along the west coast of Norway to Hammerfest. Or compare the attractions of that coast with those of a voyage from Seattle to Alaska. Carpenter, F. G.: *Europe*, pp. 191–196 (American Book); Allen, N. B. *Industrial Studies: Europe*, pp. 260–270 (Ginn); Herbertson, A. J.: *Descriptive Geography of Europe*, pp. 6–12 (Macmillan); Whitbeck, R. H.: *High School Geography*, pp. 326, 528 (Macmillan). 2. By use of a globe, explain why the sun does not set for weeks at a time at Hammerfest. 3. Why should Göteborg be a more useful port than Stockholm? Chamberlain, J. F. and A. H.: *Europe*, rev. ed., Chapter IX (Macmillan); Robinson, E.: *Commercial Geography*, p. 410 (Rand McNally). 4. Show how the West Wind Drift affects the lives of the people in western Norway. Carpenter, F. G.: *Europe*, p. 192; Whitbeck, R. H.: *High School Geography*, p. 306 (Macmillan). 5. How must the long winter darkness and the continuous daylight of summer in the northern half of the peninsula affect the habits of the people who live there? Chamberlain, J. F. and A. H.: *Europe*, rev. ed., Chapter VIII; Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, p. 38 (Wiley). 6. Look at match boxes at home and see whether you find any that came from Sweden. Why should it be such an important match-manufacturing country? Carpenter, F. G.: *Europe*, p. 197.

III. Eastern Europe

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Estonia	Republic	18,400	1,111,000	Reval (Tallinn)	130,000
Finland	Republic	132,600	3,495,000	Helsingfors	208,000
Latvia	Republic	25,000	1,845,000	Riga	338,000
Lithuania	Republic	30,000	2,450,000	Kovno (Kaunas)	92,000
Poland	Republic	149,900	30,000,000	Warsaw	1,000,000
Union of Russian Republics		1,592,800	102,536,000	Moscow	2,000,000
Russia proper	Republics and autonomous areas and territories	862,700	54,904,000	Moscow	2,000,000
White Russia		42,800	4,455,000	Minsk	105,000
Ukraine		174,000	25,808,000	Odessa	317,000
Other governments		513,300	17,369,000		

Questions. — 1. What state or outlying territory of the United States most closely corresponds in area to each of the above political units (except Russia)? 2. How does European Russia compare in area and population with the United States?

Value of Russia as an ally of England and France at the beginning of the war. — The British Isles and France together have an area of about 330,000 square miles and a population of 87,000,000; while Russia in Europe contained, before the World War, about 2,000,000 square miles and a population of 150,000,000. It is evident that it was very much larger in both respects than the British Isles and France combined. Including old Siberia and other parts of Russia in Asia, the Russian Empire covered one seventh of the land surface of the globe and had a population of 182,000,000. It is no wonder, therefore, that Russia was expected to be a valuable ally in the war.

Area and population

How much food could Russia hope to spare to England and France? It was such help that these countries would probably need most, particularly England. Russia was a vast plain, larger than all the other European countries put together. The highest land in all the interior is the low plateau, called the Valdai Hills, between Leningrad and Moscow, whose highest point is only 1,150 feet above the sea. The only mountainous regions are on the border, the Urals

Independence in food supply

1. Amount of good farm land

© Publishers' Photo Service

Fig. 367. — Daryal Gorge in the Caucasus Mountains

This gorge, nearly 6,000 feet deep at one point, has been carved in the granite rock of the Caucasus by the Terek River. The gorge is followed by a military road that leads across the mountains from Tiflis (Fig. 287).

and the Caucasus. Locate these three highlands. No other country in the world can approach Russia in amount of level land.

Much of the soil is exceedingly fertile. Stretching across southern Russia from the Carpathian Mountains to the Urals is a famous farming section known as the Black Earth or Black Mold Region (Fig. 286). Its area is estimated at from 200,000 to 400,000 square miles; its soil is fine and porous and, when wet, as black as coal. Its color is due to the vegetable mold that has collected through the centuries. In places it is from three to five and even twenty feet deep.

2. Suitability of climate for agriculture

Farming in the distant North is out of the question, for it is too cold. Snow covers the ground there at least seven months in the year. In what temperature region is this section? Where the forests have been cleared away east of Leningrad there is considerable farming; from there south the temperature is favorable to that occupation.

a. The temperatures in different regions

What part of North America corresponds to this region in temperature conditions (Figs. 12 and 290)? The great distance from the Atlantic Ocean reduces the influence of the ocean over the temperature, so that the winters are much colder and the summers much warmer than in Britain. For example, Moscow is in the same latitude as Edinburgh; but the January temperature at Moscow is about 30° colder, and the July temperature is about 6° warmer, than at Edinburgh. The hotter summers permit the raising of important crops that cannot be produced in Britain.

The warmth does not increase toward the south as much as might be expected. The level land allows the Arctic winds to sweep all the way to the Black Sea, and the warm

From The Geography of the World's Agriculture

Fig. 368

Wheat is widely distributed in Europe. Name the countries in which it is an important crop.

From The Geography of the World's Agriculture

Fig. 369

What country leads in the production of barley? Note the large amount produced in northwestern Africa.

southern winds to reach even the Arctic regions. Thus there is a remarkable similarity of temperature over this plain; and changes of temperature are both frequent and violent.

b. The rainfall

The chief difficulty in the way of productive agriculture is lack of rain, for the westerlies from the Atlantic have many other regions to serve before reaching Russia. While New York City averages forty-five inches of rain per year, Leningrad has only eighteen inches and Warsaw twenty-two; and the fall decreases toward the east and south (Fig. 291). Astrakhan on the shore of the Caspian Sea has only six inches; north and west of that sea, in the horse latitudes (p. 236), is an area of semi-desert as large as the state of Texas.

Fortunately, most of the rain comes in the spring and early summer, during the growing season. The flatness of the land, also, prevents the water from running off, and the coolness of the temperature checks its evaporation. Nevertheless, danger from drought is always felt, and Russia has often suffered from famine on that account.

3. Quantity and variety of farm products

Central Russia raises agricultural products similar to those of our North Central States. Farther south there is too little rain for some of our crops, but wheat flour ishes (Fig. 368). The wet springs give the wheat stalk a sufficient start, and the dry summers are favorable for harvesting. Before the war Russia planted much more land in wheat, oats, rye, barley (Fig. 369), and flax (Fig. 370) than we did, and, while

From The Geography of the World's Agriculture

Fig. 370

we generally produced more wheat and oats, she far surpassed us in the yield of these other grains. She raised eighty per cent of all the flax fiber grown. If it had not been for our corn, which is our greatest grain crop, Russia would have outranked the United States as a grain-producing country. The lack of rain in the section that has suitable temperatures greatly limits the growth of corn.

In the extreme southern parts of Russia, the Crimean Peninsula, and the Transcaucasian Federation, the rainfall is greater and the temperature milder, so that grapes, olives, figs, the mulberry tree, and cotton are grown. Locate these sections. Grazing is carried on extensively in the lands too dry for farming.

© *Underwood and Underwood*

Fig. 371. — A peasant home in central Russia

Log cabins suggest a cold climate, an abundance of timber, and frugal living. Do these conditions exist here?

Not only were the farm implements and the methods of tilling the soil very old-fashioned in most places, but the arrangements for the ownership of land were even worse. The great majority of farmers did not live on the land that they cultivated; they lived in villages containing from 200 to 500 persons; and the village, rather than the individuals in it, owned the surrounding land. A committee of citizens appointed for the purpose assigned to each man the area that he should cultivate. The amount of land received depended largely on the size of the family; and it was not generally all in one piece, for in that case some persons might obtain better plots than others. This danger was further avoided by changing, from time to time, the plots that any one man held. The committee in charge made such assignments and such changes as it thought best; and it could even direct a man as to what crops he should plant, when he should plant them, and when he should begin the harvest. These little farming communities were called *communes* or *mirs*. About eighty per cent of the land owned by peasants was held in this way. What effect must such an arrangement have had upon the ambition of each man to work hard, to save, and to get ahead? What effect must it have had on the use of machinery, when a man had in one place a plot 30 feet wide, one 200 feet wide in another, and one 100 feet wide in a third? What must have been the effect on the quantity of farm products raised?

4. How the land was owned

A large part of all the land, however, was held in enormous estates that were farmed by tenants. Do you see any connection between such management of the land and the fact that the average yield of wheat per acre was only a little over nine bushels? Recall the yield in other wheat-producing countries.

In spite of all these handicaps, Russia

ranked high as an agricultural country. Agriculture was the chief occupation; more than three fourths of her vast population were dependent upon it. Thus England and France could well expect great supplies of food from her as an ally.

Russia possessed an abundance of other raw materials. Eastward from Leningrad is a forest belt several hundred miles in width that extends all the way across Russia in Europe and Russia in Asia. It is probably the greatest timbered area in the world. While the trees had been cleared away in places for farms, more than one third of European Russia was still forested and timber was one of the leading exports.

Abundance of other raw materials

© *Underwood and Underwood*

Fig. 372. — In the Baku oil fields

Minerals, also, were abundant. Coal-bearing rocks are widely distributed, and new deposits were continually being discovered. The coal beds which were most valuable and most worked lay in the southeast near the Don River (Fig. 287); but coal was mined also in Poland and in the Ural Mountains.

Russia ranked next to the United States in the production of petroleum, Baku, on the Caspian Sea, being the center of the oil industry. Naturally most of the oil was used in Europe. Yet this location of the wells was unfortunate for supplying either Europe or Asia. Most of the oil had to go westward to Batum on the Black Sea (Fig. 287) for shipment abroad. Note the kind of country it had to cross. Yet what other outlets, either by rail or water, were possible?

Iron ore was mined in several places, but most extensively in southern Russia. Some of the best mines are near coal fields. Russia also furnished almost the entire world's supply of platinum, the most valuable of the precious metals. Other minerals found there are copper, zinc, mercury, and graphite (from which lead pencils are made). Many of these raw materials were expected to be of great value in the war.

Russia had always been backward in manufacturing. The greatest manufacturing center was Moscow and vicinity, where large quantities of textiles and small metal goods were produced. Leningrad ranked next, manufacturing textiles and metal and rubber articles. Warsaw made machinery, food products, textiles, and leather goods. Odessa led in the milling of flour. Locate these cities.

Russia's weakness in manufacturing

Russia was, however, far from supplying her own needs in manufactured goods. Her long distance from foreign manufacturing centers and the long winters when little farm work could be done had favored the growth of factories; yet there was so much land that it had always been possible to

make at least a living from the soil, and for that reason most of the people had remained farmers. Contrast Russia in this respect with England.

It was evident at the beginning of the war that, while Russia might raise an enormous army and supply her allies with huge quantities of food, she might have to depend upon them to a great extent in order to equip her soldiers with clothing, blankets, ammunition, guns, and other necessities of war.

© Underwood and Underwood

Fig. 373. — The Kremlin, Moscow

The former palace of the Czars, now the chief Government building of the Russian Union, is shown here. The wall surrounding the Kremlin is a mile and a quarter long and sixty feet high. Within are cathedrals and other historic buildings.

Difficulties of transportation. — Much depended, therefore, upon free commerce between Russia and her allies; but there were serious difficulties in the way. The principal Russian ports through which imports and exports might be expected to pass were Odessa on the Black Sea and Leningrad and Riga on the Baltic (Fig. 310). Although railways are easily built in such level country, these points were not well connected by rail with the interior. How many railroads can you count that enter each port (Fig. 310)? The entire country had only 36,000 miles of railway. How much have we (p. 212)?

Of inland transportation

There are, however, many important rivers that are navigable during the open season for almost their entire length. Name and trace the larger ones. While there is no central stream, like the Mississippi, they are well connected by a network of canals. Transportation from the interior to these seaports was, therefore, fairly good, although the winter ice and the irregular courses of the rivers greatly interfered with their usefulness.

There were more serious difficulties in the way of foreign commerce. Wheat and flour would naturally leave Russia through Odessa, since vast wheat fields lay north of this city and it was the chief center for both products. But this route led through the Bosporus (Fig. 287), and Turkey, which controlled it, had joined Germany against Russia and her allies soon after the war began. Make a sketch of the route from the Black Sea to the Mediterranean, and note how much of it was under the control of Turkey. The outlets from Leningrad and Riga were no easier. The Germans commanded the lower Baltic and had their principal naval base at Kiel. Make a sketch of this route also. One other

Of foreign commerce

possible route remained. This was by rail to Archangel or to Murmansk (Fig. 287), and thence by the Arctic Ocean around Norway and Sweden. What objections to this outlet are immediately apparent?

The Russian revolution. — In March, 1917, the government which had misruled the Russian people for centuries was overthrown, and Russia's part in the World War was interrupted by strife within her own borders. For four years parties brought into being by the revolution fought either the Czarists or each other. Foreign countries intervened and withdrew. In the end the party of the *Bolsheviki* secured control, and the working people, especially those of the cities, became the rulers of the country. Property was confiscated, estates were seized, and the homes of the wealthy were turned into hospitals and museums. But the lot of the peasants, who form nine tenths of the population, was not improved; in fact it was made worse by the suffering which accompanied the war and a famine which followed the destruction of the railroads.

Its failure to effect the material welfare of the people

Before the revolution more than eighty per cent of the Russians were unable to read or write. The Russians are now eager to learn, and this percentage is steadily being reduced. Nevertheless most of the Russian people are still too ignorant to know whether they are being governed wisely or unwisely.

Improvements in evidence since the revolution

Most people in other countries believe that the present rulers of Russia have made many mistakes, especially in taking property from its former owners in such a way that foreigners have been afraid to invest their money in Russia. Nevertheless the Russian people are being helped in many ways by the present government. The railroads have been rebuilt and many factories reopened. Russia is beginning to welcome strangers and the new government already has its ministers and representatives in most foreign countries.

© *Underwood and Underwood*

Fig. 374.— The University of Leningrad

Before the war this university had about 4,000 students and ranked among the greatest educational institutions of the world. What effect would you expect the rule of the Bolsheviki to have had on its activities?

In the vast extent of Russia there are people of many races who speak many different languages and have many different customs. Each group is now given all the freedom that

is believed possible without permitting the Russian nation to fall apart. In the Russian Union there are six chief republics or groups of republics, which you will find listed in the Appendix. Study the maps (Figs. 287, 400, 406, 427) in connection with the Appendix to learn the names and locations of the subdivisions of the Union.

The present political organization of Russia

© Ewing Galloway

Fig. 375. — A Polish Market

What kinds of produce can you recognize? What indications do you see of poverty or prosperity? Notice especially details of costume and the types of vehicles in use.

Some of Russia's losses following the war. — Russia has suffered far greater losses of territory and population than even Germany; but they have been caused by the discontent of her own people rather than by peace conditions fixed by a victorious enemy.

For example, the Finns until a few years ago had an arrangement with Russia by which they were allowed a large degree of liberty. But the old Russian Government failed to keep its agreements and bitterly persecuted the Finns. Accordingly, at the first opportunity in the confusion after the war, they declared their independence and formed a republic, with Helsingfors as the capital. Estimate its distance from Leningrad (Fig. 310). What are some of the natural disadvantages of its location?

By the formation of Finland as an independent nation

In the table on p. 349, note the area and population of Finland. It has been called the "land of a thousand lakes," having been left by the Ice Sheet with a very uneven surface. Although farming is the chief occupation, agriculture is still in a very backward condition; only eight and a half per cent of the land is cultivated, and only five per cent is in pasture. While more than one half of it is forested, Russia still has so much forest land that the loss of the Finnish forests is not a serious blow. Yet in one respect the loss of Finland is indeed disastrous to Russia; the Finns were among the best educated people in the empire, and their influence is now sadly needed. What disadvantages for the development of Finland do you see in its location?

Like the Finns, the Poles have long been among the more intelligent people in this section of Europe. We Americans in particular have always felt a special interest in and regard for them, for they have shown great enthusiasm for liberty and for our form of government. Poles have emigrated to America in great numbers, until it is estimated

By the formation of Poland as an independent nation

1. Character of the Poles

that there are now among us as many as 4,500,000 people of Polish descent.

2. Area, population, and products

In several respects, aside from the character of the people, the loss of Poland has been a severe blow to Russia. Note the area of Poland (p. 349). Approximately one half this area has been taken from Russia and the rest from Germany and Austria. Poland was an independent and powerful country for hundreds of years; but more than a century ago it was forcibly divided among Russia, Prussia, and Austria, and ceased to exist as a separate nation. In spite of persecution the Poles have retained their language and their national feeling, and now as a result of the war they have regained their independence. They have formed a republic, with Warsaw as its capital. The boundary line has been so drawn as to include whatever portions of Russia, Germany, and Austria are still mainly Polish in population. That largely explains its irregularity. Note that the vicinity of Danzig is not included, for its population is chiefly German; this has been made a *free city*, privileged to govern itself but not to interfere with Polish trade on the river at whose mouth it lies. Sketch the outline of Poland. Within these bounds are more than 30,000,000 inhabitants, the greater proportion of whom were formerly Russian subjects.

Note how much of the country is included within the Vistula Basin. This is one of the most fertile regions in Europe, noted for its wheat and other grains; the methods of farming here are in advance of those in the adjoining regions. Village ownership of land exists here (p. 352), but ownership by individuals is much more common than in Russia.

© *Underwood and Underwood*

Fig. 376. — The Dnieper River at Kief

Locate Kief. It is a manufacturing and trading center for a large and prosperous farming section.

What makes the loss of Poland still more serious is that this was one of the leading centers in Russia for both mining and manufacturing. Warsaw (p. 485) was the third city in size in all Russia. Lodz, also a manufacturing center, has a population of 500,000. Locate these cities.

These are by no means all the actual or probable losses. Russia, before the war, had been the home of many different peoples, with widely different languages and customs. Several of these besides the Finns and Poles desire independence.

Other losses

Three new countries on the Baltic Sea, Latvia, Estonia, and Lithuania (Fig. 310), have become independent nations. The important port of Riga is the capital of Latvia.

In addition to the loss of these Baltic states, several large areas of Russia have set up their own governments but still acknowledge the leadership of the government at Moscow. These are Ukraine, White Russia, and Transcaucasia (Transcaucasian Federation). Ukraine, the large section north of the Black Sea, is by far the most important of these countries. It includes three large cities — Kief, Kharkof, and Odessa. It includes, also, a part of the very fertile Black Earth Region (p. 350) and is noted particularly for its wheat (Fig. 368). Some of the most valuable coal and iron mines of old Russia are found here. White Russia is the name given to an area immediately east of the border of Poland. The Transcaucasian Federation is a union of three Russian states, Azerbaijan, Georgia, and Russian Armenia, south of the Caucasus Mountains. These states properly belong to the continent of Asia, although they were formerly considered a part of European Russia.

Facts to be especially well fixed. — 1. The area and population of Russia in Europe before the war. 2. Character of its surface, the temperature regions, the distribution of rainfall, and the natural vegetation. 3. Location of the following rivers: Volga; Don; Dnieper; Dvina. 4. Leading farm products. 5. Other raw materials and their location. 6. Location of the following cities: Moscow; Leningrad; Archangel; Riga; Warsaw; Lodz; Kief; Odessa; Astrakhan; Baku; Helsingfors.

Problems for independent study. — 1. What probable relation do you see between these facts: (1) Russia has been producing eighty per cent of all flax fiber; (2) It was almost impossible to buy linen handkerchiefs in New York City in 1919? 2. Find out about the appearance and uses of platinum. 3. Of mercury. Consult an encyclopedia. 4. Why would it perhaps have been better for Russia if its rivers had flowed east and west, rather than north and south? 5. On p. 488, look up the length of the Volga River. This river rises in a region whose highest point is 1,150 feet, and empties into the Caspian Sea 85 feet below sea level. About how many inches, on the average, does it fall per mile? What advantages or disadvantages do you see resulting from this fact? 6. Compare the average yield of wheat per acre in England and in Belgium with that in Russia. See the Statesman's Year-Book (Macmillan). 7. Make a drawing of the land around a Russian village so as to show how you understand the fields to be divided up. 8. Write a composition comparing the Volga with the Mississippi River. Allen, N. B.: *Industrial Studies: Europe*, pp. 136–139 (Ginn); Whitbeck, R. H.: *High School Geography*, pp. 134–146, 170–173 (Macmillan); Carpenter, F. G.: *Europe*, pp. 371–376 (American Book); Smith, J. R.: *Industrial and Commercial Geography*, p. 726 (Henry Holt). 9. Write a composition on the subject: Liberty does not mean freedom to do anything one pleases. 10. Make a sketch of Russia in Europe, putting in boundaries and principal rivers and cities. 11. Make a report on the changes that have taken place in Russia since the war, noting particularly the new nations that have been established and the resulting changes in area and population. 12. Why was Germany very anxious to get control of Russia during the World War? Robinson, E.: *Commercial Geography*, pp. 938–939 (Rand McNally); National Geographic Magazine, vol. 26, pp. 453, 475–486. 13. Prove this statement: What coal is to Great Britain, the forests are to Russia. Allen, N. B.: *Industrial Studies: Europe*, pp. 134–136; The Statesman's Year-Book. 14. Think of as many differences as you can between the life of a Russian and an American. Carpenter, F. G.: *Europe*, pp. 327–345 (American Book); McDonald, E. A.: *Boris in Russia* (Little, Brown). 15. Some one has said, "The Russian peasant is the Russian nation." Find out all you can about the peasant class, and debate the question: Is Russia ready for a republican form of government? Allen, N. B.: *Industrial Studies: Europe*, pp. 129–133; Carpenter, F. G.: *Europe*, pp. 336–345; National Geographic Magazine, vol. 26, pp. 455–465; Graham, S.: *Russia and the World*, pp. 236–268 (Macmillan). 16. Find out all you can about the old despotic government of Russia, and the attempts made to overthrow it. Consult an encyclopedia.

IV. Countries of the Western Mediterranean

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Italy	Limited monarchy	119,600	42,116,000	Milan	853,000
Portugal	Republic	35,500	6,033,000	Lisbon	486,000
Spain	Limited monarchy	194,800	21,967,000	Madrid	783,000

1. Spain and Portugal

Explanation of the division of the Iberian Peninsula into two countries. — Difficulty in traveling along the deep gorges and canyons on the boundary between Spain and Portugal is one of the main reasons for the division of the Iberian Peninsula into two countries. On this account, when the peninsula was invaded from the Mediterranean in early times, Spain was conquered long before Portugal This barrier has also prevented the inhabitants of the two countries from knowing each other well and has at times resulted in lack of friendliness between them. The location of the ports and chief cities of Portugal on the Atlantic coast has furthered this separation; for the Portuguese have found it more convenient to trade with other nations on the Atlantic than with Spain.

The two countries were under one government for a time, but the union did not last. Portugal became a republic in 1910, while Spain is still a monarchy. With a smaller proportion of its population isolated in rough, mountainous country, it has been somewhat more progressive than Spain.

Difference between Spain and Portugal in climate. — Since Portugal is the most western country on the continent of Europe, its climate is much influenced by the ocean. Its temperatures are like those of San Francisco. Note how nearly that city and Lisbon are in the same latitude.

There is a striking difference between Portugal and California, however, in rainfall; for, though both regions receive most of their rain in the winter, the westerlies from over the Atlantic carry far more vapor than the winds on the corresponding part of our own Pacific coast, making floods common in Portugal and northwestern Spain. But as they travel eastward over the highlands they rapidly lose their moisture, so that a large part of Spain is semi-arid. In Fig. 291 note the difference in rainfall between the

© Brown Bros.

Fig. 377. — A village in the Pyrenees

two countries. Locate Madrid on Fig. 385. From that city one may look across the country for many miles, seeing not a tree nor fence nor house — only the weeds and scattered vegetation of a semi-desert. These barren plains are hot and dust-covered in summer, very like those of northern Mexico. In winter the winds sweep over them without check, making the country very cold and subject to sudden changes in temperature. The only green season is a brief period in the spring.

The past importance and present backwardness of this section of Europe. — Under the Moors, who invaded Spain from Africa, the Iberian Peninsula was the most advanced country in Europe 800 years ago. Many of the buildings of that period still stand as marks of its civilization. Chief among them is the Alhambra (Fig. 378) at Granada, a famous palace and fortress built for the rulers; its magnificent ruins are to-day the chief attraction of that ancient city.

Their former power

When finally the Spaniards had defeated the Moors and expelled them from Spain, they had developed so large an army that they found themselves one of the strongest military nations in the world. Soon afterward their discoveries in the New World made Spain and Portugal the greatest of the colonial powers. Can you name some of their former colonies? It is to the wealth they obtained from these rich possessions that they owe many of their beautiful churches and other buildings.

© E. M. Newman

Fig. 378. — The Court of Lions in the Alhambra, Granada

At present, Spain and Portugal are not important in world affairs. They have gradually lost their rich colonies; and even the fortress of Gibraltar (Fig. 292), guarding the entrance to the Mediterranean, is now held by the British. What former possessions of Spain are now under the control of the United States?

Their present rank

Their foreign trade is only about one fifth that of France. How does the area of Spain and Portugal together compare with that of France? There are only four miles of railroad for each 10,000 people on the Iberian Peninsula, while Canada, a very new country, has over forty. How do these facts indicate a lack of prosperity?

Reasons for their decline. — From their location between the Atlantic and the Mediterranean and between Africa and Europe, one might expect Spain and Portugal to be

great trading countries. Yet there are obstacles that almost destroy the advantages of this location. Much of the coast line is straight, and very few of the harbors are protected from ocean storms. Moreover, from the Pyrenees Mountains on the French border and the Cantabrians west of them to the Sierra Nevada in the south, most of the country is a rough, almost treeless plateau about 2,500 feet above the sea.

The character of their coast line and surface

In the Ebro Valley on the northeast, and the Guadalquivir (meaning Great River) Valley on the southwest, there are lowlands. Find these rivers on Fig. 385. The only other extensive lowland is a narrow coastal strip which reaches most of the distance around the peninsula. A very large portion of the surface, therefore, is made up of plateaus and mountains. Estimate the proportion of the total area that is included in the interior highland.

© Publishers' Photo Service

Fig. 379.—A street vender in Portugal

Do you think that American housewives would approve of such scales as are shown here?

The rivers, moreover, are of little use for navigation. Rapids occur in them where they descend from the plateau, and on account of the light rainfall most of them are at certain seasons mere successions of pools. The Guadalquivir has been made navigable as far as Seville, but none of the others is of much value to commerce. It has been said of Spanish rivers that they possess long names, narrow channels, and little water.

One can understand the difficulties of building railroads across such a country. Pack mules and oxcarts are the common means of transportation on the highways in the plateau. What does this fact indicate about the character of these roads?

The mountains and gorges have done more than merely make transportation difficult; they have cut off the various groups of people from one another and from the rest of the world.

The character of the people

On account of this isolation, the inhabitants have lived very much by themselves and have been slow to accept new ideas. Nearly sixty per cent of them can neither read nor write. Their general ignorance is suggested by the fact that they have destroyed many of their trees because the birds, which were supposed to be injurious to the crops, found shelter in them.

The people lack energy for work and are not inclined to regard it very seriously. They are ready to take a holiday on the slightest excuse. Some of the largest cities owe their growth chiefly to the love of social life. Madrid and Lisbon, with their beautiful buildings, theaters, and wide, pleasant streets, are cities for enjoyment rather than for industry, though Madrid is a railroad center of some importance. Trace several

lines that cross there. In Madrid there is an immense arena where bullfights are held; the city likewise has one of the finest art galleries in the world. Do you see anything strange in such a combination of tastes?

© *Keystone View Co., Inc.*

Fig. 380. — An olive orchard in Spain

The olive is found in most countries bordering the Mediterranean. The trees can withstand the summer droughts of that region. In many of these countries olive oil takes the place of butter and other fats.

The future of the peninsula. — The peninsula grows almost as great a variety of farm products as does the entire United States. How can you account for this? The difficulty lies in the small quantity of the products. The plateau country, in particular, is producing less than it should. One can expect much grazing there, and it is noted for the excellent grade of its sheep and mules. There are also many cattle, especially in the rainy northwest; but the fact that so much of the country is arid explains why there are many more sheep and goats than cattle. The sheep graze in large flocks, sometimes as many as 10,000 together, under the care of a number of shepherds and their dogs. In summer they feed among the mountains, but in winter they are driven down to the more protected lowlands for shelter.

The possibilities in agriculture

1. Present methods and products on the highlands

Wheat is the most common farm crop (Fig. 368), since it requires little rain, and there is much rye and barley (Fig. 369); but the methods of farming are primitive. The grain is reaped with sickles and threshed by driving horses over it. Rotation of crops is uncommon and fertilizer is little used. With the introduction of modern farm machinery and new methods of raising water from the deep-stream valleys for irrigation, together with education in agriculture, the production of the highlands could be greatly increased.

2. Products of the valleys and coast lands

In many of the valleys where irrigation is possible and on the lowlands along the coast, the farmers are more progressive and prosperous. Corn is one of the valuable crops of these regions (Fig. 392).

Partly because of its mild temperatures, which are greatly influenced by the Mediterranean, and because of the number of mountain streams which, though useless for navigation, are valuable for irrigation, the arid southeastern coast is wonderfully productive. Near Valencia, where gardens like those of California are found, the irrigation works are several hundred years old. Large amounts of fertilizer are used in the coastal district, where oranges, lemons, raisins, dates,

grapes, and olives are raised for export. Several crops of some products are grown each year. Have you ever heard of Malaga grapes? Locate Malaga on the map. At Seville olive oil is bottled in increasing quantities.

A blight in the French vineyards in 1880–1890 encouraged the exportation of Spanish and Portuguese wines, which has continued to increase until nearly all parts of the peninsula now produce grapes for this purpose. Oporto (Fig. 385) exports large amounts of *port* wine, so named because of its origin. Other crops of the peninsula are rice, sugar cane, peas, lentils, and onions; and in the south the bark of the cork oak is a source of income to both countries. By the exercise of more energy and intelligence most of these products could be very greatly increased. Portugal, especially, has great agricultural possibilities. Though only about forty per cent of the available land is now under cultivation, that country, under proper tillage, could be made as productive as California.

The peninsula is rich in minerals. Almost every district has valuable deposits. Both coal and iron are found in large amounts in the Cantabrian Mountains, where they are convenient for export to France and England. What advantage does the existence of coal and iron together suggest? Copper and mercury are found in the Sierra Morena; and immense quantities of lead, zinc, and iron occur in the Sierra Nevada. Locate these mountain ranges. Lack of transportation has hindered the development of these resources, and most results up to the present time have been due to the efforts of foreigners. But with the rapidly growing need for these minerals in the populous countries of Europe, there is reason to expect that mining in the peninsula will greatly increase in importance.

Why mining can be more extensively developed

Photo by Elmendorf © Ewing Galloway

Fig. 381. — Gold mining near Granada

For the method employed, see page 134.

The minerals should not be produced for the use of foreign countries alone. Spain and Portugal lose much each year by exporting raw material and importing finished goods at a great advance in price. With their abundance of coal and water power they could do a large amount of manufacturing. Although they produce nearly three quarters of the world's supply of cork, only one half of it is made into stoppers before export. Some steel is made at Bilbao, but with coal and iron in the neighboring mountains the amount

Possibilities in manufacturing

should be greatly increased. Their other minerals also should be far more extensively used at home. While cotton and flax for textiles are wanting in the peninsula, it is noted for its wool (Fig. 306), and the presence of coal in addition should give great encouragement to the textile industry. At present Barcelona is a center for textile manufacturing, and Cordoba (Fig. 503) is noted for its leather industry.

There was considerable increase in shipbuilding in these countries during the World War, and it is probable that they will have greater foreign trade as their manufacturing and mineral resources develop. Lisbon, at the mouth of the Tagus River, has one of the finest harbors in the world, and Barcelona and Cadiz are also good ports. The harbor at Vigo is being improved by American capital with a view to saving twenty-four hours on the trip from New York to Paris. What reasons do you see for expecting such a saving? In Fig. 502 estimate the length of the railroad from Vigo to Paris. What mountain range does it cross? Do you think the trip by that route would be more or less interesting than the one from New York to Havre by boat and thence by train to Paris? Why?

Possibility of increase in commerce

Facts to be especially well fixed. — 1. The climate of the peninsula. 2. The courses of the Ebro, Guadalquivir, and Tagus rivers. 3. Principal agricultural products. 4. Principal minerals. 5. Location of Madrid; Barcelona; Valencia; Seville; Cadiz; Lisbon; Oporto; Pyrenees Mountains; Cantabrian Mountains; Sierra Nevada.

Problems for independent study. — 1. Read Washington Irving's *The Alhambra.* 2. Why should England greatly value the fortress at Gibraltar? Carpenter, F. G.: *Europe,* pp. 476–479 (American Book); Packard, L. O., and Sinnott, C. P.: *Nations as Neighbors,* p. 311 (Macmillan); George, M. M.: *A Little Journey to Spain and Portugal,* pp. 63–66 (Flanagan). 3. Plan a tour through Spain and explain its attractions. Carpenter, F. G.: *Europe,* Chapters LXIV–LXVII; Browne, E. A.: *Peeps at Many Lands: Spain* (Macmillan). 4. Make a comparison between Spain and Mexico. There are many points of similarity. 5. Draw a cross-section map, or profile, of Spain and Portugal running east and west through Madrid, and compare it with one across Mexico running through Mexico City. Make the drawing according to a scale. 6. Draw an outline of the peninsula, including the principal mountains, rivers, cities, and location of leading minerals and farm products. 7. How do you account for the fact that Madrid is the largest city in Spain?

2. Italy

Advantages of position. — Italy's position in the center of the Mediterranean has been of the utmost importance ever since ancient times. A great commerce was built up at the time of the Roman Empire, when Rome controlled most of the world that was then known. Centuries later Venice and Genoa ranked among the greatest ports in the world. Locate them on Fig. 385. What appear to you to be some of their advantages for trade with other Mediterranean countries? The great route to the Orient over which most of the trade of the Middle Ages passed lay through Italy. In Fig. 495 trace the overland-sea route from India to Genoa and Venice and thence to the countries of northern Europe.

When an all-sea route around Africa to the Orient was discovered, the Atlantic ports supplanted the Italian ports. However, the opening of the Suez Canal (Fig. 473) restored the importance of the Mediterranean again in the Oriental trade, though most of Italy's trade is still with Mediterranean ports. The Oriental mails from London, Paris, and Berlin are sent by rail to Brindisi, in southern Italy, and there placed on vessels for the Far

East and Australia which leave Great Britain some two or three days before the mails. What control can Great Britain exert over Italy's ocean commerce through its possession of Gibraltar and the Suez Canal?

A comparison with two of our states in area and population. — How small in area most of the European countries are is strikingly shown by comparing them with some of our own states. Iowa and Missouri are by no means among our largest states, yet their combined area is considerably greater than that of Italy, although that country includes the two islands, Sicily and Sardinia. Locate these on Fig. 385.

The population of Italy, however, is about 42,000,000, while that of these two states together is less than one seventh as great. Evidently Italy is very crowded. With the exception of Belgium, The Netherlands, and Great Britain, it is the most densely populated country in Europe. On the average, there are less than two acres of land per person. Find what the average is in Iowa.

© *Underwood and Underwood*

Fig. 382. — The Grand Canal, Venice

Venice is built on a group of islands in a lagoon on the low, marshy shores of the Po delta. Many of the streets are canals. The boats in the foreground are called *gondolas*.

Obstacles in the way of prosperity. — An examination of Fig. 385 shows that about two thirds of the total area is too mountainous for extensive agriculture. Italy is one of the most mountainous countries in Europe. In the north are the Alps, some of whose highest peaks are on the boundary between Italy and Switzerland. The Alpine ranges curve around in northwestern Italy and join the Apennines, which extend the entire length of the peninsula and form a high central ridge. The principal lowlands, therefore, are the narrow coastal plains and the broad Po Valley. The character of the surface explains why, in Fig. 294, there are so few dots in the interior except in the Po Valley, and so many along the coast.

Obstacles to agriculture

1. Character of the land surface

Another serious hindrance to successful agriculture has been the extensive destruction of the forests. That has allowed the water to carry away great quantities of soil; as a result, there is in many places only bare rock or very thin soil, and many of the lowlands are covered with silt, sand, or gravel.

The rainfall map (Fig. 291) appears to indicate that the rainfall is sufficient for agriculture. There is one difficulty, however. Except in the north, the greater part of this rain comes in winter, when it is least needed. The drought in summer is due to the fact that the belt of horse latitudes moves northward and covers much of Italy, just as it covers much of California

2. The want of rain in the growing season

and of Spain (Fig. 242). On that account agriculture without irrigation is not profitable in most parts of the peninsula.

Still another difficulty is the presence of broad, marshy tracts infested with mosquitoes, which spread malaria. This is especially true in the southern half of the country, where, even with fertile soil and a warm climate, large tracts of land have had to be abandoned. Around Rome, for example, beautiful pasture land stretches out for many miles, without a house anywhere in sight. Because they dread malaria people shun the region, so that the land is used only for grazing. As summer approaches, even the herdsmen flee for safety with their cattle and sheep to the mountains. One sixth of the population suffers from malaria, which causes thousands of deaths every year. The Italian government is attempting to stamp it out, but its progress has been slow.

3. The seriousness of malaria

© *Underwood and Underwood*

Fig. 383. Picking lemons near Palermo, Sicily

The countries of the western Mediterranean have a climate similar to that of southern California. Hence the agricultural and horticultural products of the two regions are similar. Until recent years Sicily exported lemons to the United States; now, however, most of our lemons come from California.

Owing to such difficulties, only about one half of the land produces crops; there is thus only about one acre, on the average, for the support of each inhabitant.

Keenness of competition with other countries causes a fourth difficulty in the way of successful agriculture. Few countries raise all the farm products they need; the chief way to obtain food needed from abroad is to raise enough of some kinds so that large quantities of them can be exported in return for others. Can you give some examples of such an exchange?

4. Keenness of competition with other countries

Being protected by the lofty Alps from the cold north winds and moderated in temperature by the warm Mediterranean Sea, Italy enjoys a mild climate, which permits a large variety of crops. Citrus fruits, such as oranges and lemons (Fig. 383), are common; there are vegetables of many kinds; and nuts are abundant, particularly the chestnut, which is a very important food. It is boiled or roasted and is also ground into meal just as wheat is ground into flour. The extensive pasture lands encourage dairying on a large scale, goats being raised extensively for their milk (Fig. 388). As in Spain, they are often driven into the cities and milked at the doors of customers. The larger part of all these products, however, except fruits, is consumed in Italy.

The more important products that are extensively raised are wheat, corn, grapes, olives, rice, and mulberry leaves for the silkworm. Some of these are exported to a con-

siderable extent either in the raw or in a partly manufactured state; but strong competition by other countries in each case threatens the profits. For example, while Italy ranks as the third nation in the world in the production of raw silk, it must compete with China and Japan. Wheat and grapes occupy the largest acreage, yet Russia and America raise wheat much more cheaply; and French wines surpass Italian wines. Italy stands first in the production of olive oil, yet it must compete with that of France, which is of excellent quality. America entirely outranks Italy in production of corn, and China and Japan far surpass her in rice production. Thus Italy achieves no great degree of superiority or independence in the growth of any one crop.

© *Underwood and Underwood*

Fig. 384. — Marble at the quarries, Carrara, Italy

Locate Carrara on Fig. 503. The marble from these quarries has been used for many centuries for buildings and for statuary. The freedom from stain and cracks makes it especially valuable to sculptors. In what range are the mountains in the background?

Want of minerals

How does she rank as a mining and manufacturing country? Some of the most prosperous countries have far more than balanced their disadvantages in agriculture by their development of mining and manufacturing. Can you give examples?

Italy's disadvantage is even greater in these industries than in agriculture, for she lacks coal, except lignite, and has little iron ore. Coal is one of her leading imports, much of it being brought from England. In Fig. 495 follow the water route by which it reaches Italy. There are only two minerals for which Italy is distinguished. One is sulphur from the volcanic rock of Sicily, which

Questions on Fig. 385. — 1. Name three of the most important railroad centers shown on this map. 2. What advantages can you see in the use of the chief canal shown here? 3. What areas in Spain, Italy, and northwestern Africa would you expect to be best adapted to agriculture? Why? 4. Compare this map with Fig. 242 and show how the prevailing winds and the position of the highlands explain the areas of greatest rainfall. 5. If you wish to look up smaller places than those shown on this map, consult Fig. 503.

HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
WESTERN MEDITERRANEAN COUNTRIES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300
Railroads
Canals
Capitals of countries
Williams Engraving Co., N.Y.
1028
5° Longitude West from Greenwich 0° Longitude East from Greenwich 5°
ATLANTIC OCEAN
BAY OF BISCAY
FRANCE
SPAIN
PORTUGAL
SWITZERLAND
AUSTRIA
HUNGARY
YUGOSLAVIA
ITALY
ALBANIA
CORSICA (To France)
SARDINIA (To Italy)
BALEARIC ISLES (To Spain)
MINORCA
MAJORCA
IVIZA
MEDITERRANEAN SEA
TYRRHENIAN SEA
IONIAN SEA
AEGEAN SEA
MOROCCO
NORTHERN ALGERIA
SOUTHERN ALGERIA
TUNISIA
SPANISH ZONE
Strait of Gibraltar
Strait of Messina
Gulf of Lyon
Gulf of Genoa
Gulf of Venice
Gulf of Taranto
Gulf of Cadiz
Paris
Lyon
Marseille
Toulon
Nice
Monaco
Bordeaux
Toulouse
Montpellier
Beziers
Perigueux
Limoges
St.Etienne
Grenoble
Geneva
Lausanne
Bern
Lucerne
Milan
Turin
Genoa
Venice
Padua
Trieste
Fiume
Leibach
Gorizia
Ferrara
Bologna
Florence
Leghorn
Rome
Naples
Bari
Brindisi
Barcelona
Saragossa
Madrid
Valencia
Palma
Alicante
Cartagena
Murcia
Malaga
Seville
Cordoba
Granada
Lisbon
Oporto
Vigo
La Coruna
Oviedo
Gijon
Santander
San Sebastian
Bilbao
Bayonne
Burgos
Valladolid
Salamanca
Algiers
Oran
Constantine
Bone
Philippeville
Tunis
Bizerta
Sfax
Tuggurt
Wargla
Biskra
Laghouat
Tlemcen
Mellila
Tangier (Neutral Zone)
Ceuta
Tetuan
Gibraltar (Br.)
Rabat
Casablanca
Fez
Mekinez
Ajaccio
Cagliari
Palermo
Messina
Catania
Mt.Etna 10,755 ft.
Mt.Vesuvius 4360 ft.
Mt.Blanc 15,782 ft.
Mt.Cenis Pass 6870 ft.
St.Gothard Pass
Simplon Pass
St.Bernard Pass 8110 ft.
Brenner Pass 4744 ft.
Semmering Pass
L.Como
L.Garda
Scutari
Durazzo
Avlona
Cattaro
Cetinje
Serajevo
Zara (Italy)
Lagosta (To Italy)
Elba (To Italy)
Malta (Br.)
C.Bon
C.Passero
C.St.Vincent
C.Spartivento
Strait of Bonifacio
Strait of Otranto
Lipari or Aeolian Is.
Aegadian Is.
Sasseno (To Italy)
Rocheforte
Bay of Biscay
Landes
Garonne R.
Rhone R.
Saone R.
Loire R.
Gironde R.
Ebro R.
Douro R.
Tagus R.
Guadalquivir R.
Drave R.
Save R.
Pyrenees Mts.
Cantabrian Mts.
Sierra Morena
Sierra Nevada
Cevennes Mts.
Dinaric Alps
Apennines
Great Atlas Mts.
Little Atlas Mts.
Plateau of the Shats
Shat Melghir
Shat el Jerid
Sahara
Central Plateau
Iberian Peninsula
Iberian Plateau
Italian Peninsula
Andorra
San Marino
Monaco
Algerian (To France)
(To France)

Fig. 385

COUNTRIES OF THE
DANUBE AND THE BALKANS
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300
Railroads
Canals
Capitals of Countries
HEIGHTS IN FEET
Over 10,000
5,000 to 10,000
2,000 to 5,000
1,000 to 2,000
500 to 1,000
Sea level to 500
Longitude East from Greenwich
Williams Engraving Co., N.Y.
GERMANY
POLAND
CZECHOSLOVAKIA
AUSTRIA
HUNGARY
RUMANIA
UNION OF RUSSIAN SOCIALIST REPUBLICS
YUGOSLAVIA
BULGARIA
ALBANIA
GREECE
TURKEY
ITALY
SICILY
MEDITERRANEAN SEA
BLACK SEA
Adriatic Sea
Tyrrhenian Sea
Ionian Sea
Aegean Sea
Sea of Marmora
Prague
Vienna
Budapest
Belgrade
Sofia
Bucharest
Constantinople
Athens
Rome
Naples
Munich
Nuremberg
Trieste
Venice
Fiume
Zagreb
Sarajevo
Skopje
Salonika
Smyrna
Palermo
Messina
Mt. Etna 10,755 ft.
Mt. Olympus 9,800 ft.
Mt. Vesuvius 4,000
Danube
Dniester
Prut
Dardanelles
Bosporus
Strait of Messina
Strait of Otranto
Gulf of Taranto
Gulf of Salonika
Gulf of Corinth
Isthmus of Corinth
Transylvanian Alps
Carpathian Mts.
Pindus Mts.
Apennine Mountains
Dinaric Alps
Julian Alps
Hungarian Plain
Wallachian Plain
Transylvania Plateau
Lake Balaton
Lake Scutari
Iron Gate
Kishinef
Odessa
Akkerman
Galatz
Braila
Ploesti
Constantza
Varna
Burgas
Adrianople
Philippopolis
Monastir
Serajevo
Agram
Laibach
Gratz
Lemberg (Lwow)
Przemysl
Krakow
Kosice (Kassa)
Pressburg (Bratislava)
Brunn (Brno)
Pilsen (Pizen)
Prague (Praha)
Carlsbad
Eger
Budweis
Linz
Salzburg
Innsbruck
Lienz
Debreczen
Grosswardein
Klausenburg (Cluj)
Hedmezo Vasarhely
Szegedin
Arad
Temesvar
Maria Theresiopel
Funfkirchen
Banjaluka
Mostar
Cattaro
Cetinje
Scutari
Durazzo
Tirana
Avlona
Uskub
Nish
Belgrade
Krajova
Ruatschuk
Plevna
Shumla
Sliven
Sergs
Kavala
Dedeagatch
Gallipoli
Brusa
Skutari
Larissa
Yanina
Trikala
Patras
Corinth
Athens
Piraeus
Kalamata
Candia
Canea
Cerigo
Malta (Br.)
C. Passero
C. Matapan
Lipari or Aeolian Is.
Stromboli
Ionian Islands
Northern Sporades
Cyclades
Dodecanese Is. (To Italy)
Rhodes
Crete
Lemnos
Mitylene
Chios
Samos
Nikaria
Skyros
Thasos
Samothrace
Imbros
Euvia
Andros
Naxos
Melos
Milos
Zara (To Italy)
Lagosta
Spalato
Pola
Gorizia
Trieste
Venice
Fiume
San Marino
Dalmatia
Bosnia
Herzegovina
Montenegro
Albania
Macedonia
Thessaly
Thrace
Moldavia
Bukowina
Bessarabia
Jassy
Czernowitz
Tarnopol
Miskolcz
Tokay
Kronstadt
Timesvar
Orsova
Turnu Severin
Rustchuk
Silistria
Erz Mts.
Bohemian Highlands
Danube
Drave
Save
Theiss
Pruth
Dniester
Rol
Alps
Adriatic Sea
Aegean Sea
Sea of Marmora
Dardanelles
Bosporus
Black Sea
Mediterranean Sea
Ionian Sea
Tyrrhenian Sea
Adriatic Sea
Gulf of Taranto
Strait of Messina
Strait of Ot

Questions on Fig. 386. — 1. Study this map carefully in comparison with Fig. 331 to determine which boundaries have been changed as a result of the World War. Are the boundaries of these countries, on the whole, more natural or more artificial than they were before the World War? 2. Name two of the most important railroad centers. 3. Show why the location of Fiume has made it desired by more than one country. 4. If you wish to find smaller places than those shown on this map, consult Fig. 504.

---

is produced in great quantities and forms one of the chief Italian exports. The other is the remarkably beautiful Carrara marble, which is quarried east of Genoa and is in much demand for making statues and adorning buildings (Fig. 384).

© Publishers' Photo Service

Fig 387. — A portion of the water front at Genoa
What famous explorer and discoverer came from Genoa?

From these facts it is plain that Italy has little hope of ever becoming a great mining or manufacturing country. In spite, therefore, of her unfavorable conditions for agriculture, she is still mainly an agricultural country. It is plain, too, that she is not a rich country. With her dense population and comparatively few products, she ranks far behind the other great nations of the world in wealth and power. Her poverty is the chief reason why Italian immigrants have been coming to our shores in such large numbers. In some years more than one quarter of all our immigrants have been Italians.

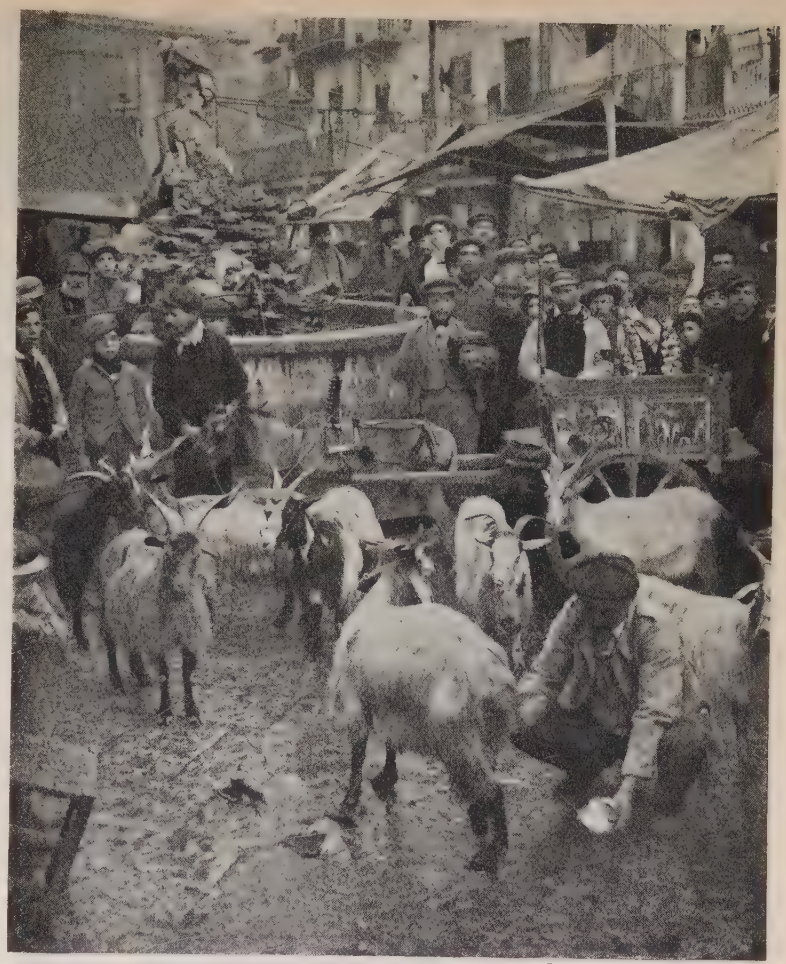
Why northern Italy is the most prosperous section. — The Po Valley is the largest and most prosperous farming region in Italy. In Fig. 385, about what proportion of the country do you estimate it occupies? Once an arm of the Adriatic, this valley has been filled in gradually with soil deposited by the streams from the mountains, and is in general very fertile. Although it lies in about the same latitude as Montreal, it has a favorable climate for agriculture, for the Alps form a barrier against the north winds and also cause a moderate rainfall throughout the year. Among the products are grapes, wheat, corn, hemp, and flax. Frequent floods of the Po and other rivers make portions of the lowland very swampy; in such sections rice is cultivated, Italy being the only European country which produces large amounts of this crop. At what season of the year would you expect such floods? Although irrigation is not absolutely necessary, the numerous streams and adjoining level land make it very easy, and it is usually found to be profitable. On irrigated fields as many as nine crops of fodder are harvested in a single season. Dairying is therefore widespread.

Importance of the Po Basin for agriculture

The mulberry tree also produces several crops of leaves, but in addition to home production much raw silk is imported from the Orient.

Extent and kinds of manufacturing

Nearly all the manufacturing cities of Italy are in the north, where Fig. 294 shows the population to be greatest. Advantages for manufacturing are found there which partly make up for Italy's serious lack of minerals. Although coal is lacking, the many mountain streams are used to provide electric power. Locate the chief manufacturing cities, Milan and Turin. Easy transportation routes to the larger European countries make it easy also to import coal and raw materials. In Fig. 385 trace several of these routes. Note that Genoa is the principal port for this region. At Milan and Turin, the textile industries are the most important, silk, woolen, and cotton goods being manufactured. Turin, however, manufactures large amounts of machinery, automobiles, railroad cars, and locomotives. Wine, olive oil, and cheese are also prepared for export.



© *Underwood and Underwood*

Fig. 388. — The market place, Naples

Goats are common in most of the Mediterranean countries, since they can thrive on much poorer pasture than sheep. They are raised for their milk and for use as beasts of burden. Some of the cheese that we import from Italy and Switzerland is made from goat's milk.

The Italians are especially noted for their artistic taste, and their manufactured articles are much sought after on this account. The glassware made at Venice is particularly beautiful. Handmade jewelry, such as carved coral, is in great demand. Florence is one of the important art centers of Italy and is much visited by tourists. It manufactures art goods and articles consumed in the neighboring farming region. It also leads in the straw-plaiting industry; a coarse variety of wheat supplies the straw, which is plaited into especially fine hats. You may have heard of Leghorn hats, named after a city on the coast near Florence (Fig. 385). In what other country have we found that the artistic taste of the people greatly affected their manufactures (p. 315)?

Why Naples is an important city. — Naples, with a population of nearly 800,000, is the second city in size. It lies in the center of an important farming region. From time to time for nearly 2,000 years Mount Vesuvius (Fig. 286) has poured lava and ashes over the surrounding country, sometimes burying entire towns. The gradual decay of this volcanic material has made the plains of this district unusually rich.

© *Keystone View Co., Inc.*

Fig. 389. — The Colosseum, Rome

This is one of the most celebrated ruins in the world. Here, in ancient times, *gladiators* fought with each other and with wild beasts for the amusement of many thousands of spectators.

The moderate winters are also favorable to agriculture. The westerly winds from the Mediterranean bring warmth and moisture to the western coast, so that the temperature at Naples seldom falls to freezing, although it is in about the same latitude as New York City. The wet winters are very beneficial to the growth of wheat and grasses.

While the belt of calms in summer causes drought and high temperatures, it produces a climate to which the olive is well adapted; the olive tree is accordingly seen practically everywhere. Fruit trees such as the orange, lemon, lime, and fig also flourish, and the bright sunshine makes grape culture unusually successful, many regions presenting the appearance of an almost continuous vineyard.

The Bay of Naples furnishes one of the best harbors in Italy, ranking next to that of Genoa in commercial importance. A considerable proportion of the produce of southern Italy is shipped from it. It is also a fishing center, for the sea furnishes a wealth of sardines and tunny fish. Precious coral is another product of the sea, and sponges are brought from the coastal waters of Libia (Fig. 473).

Importance of tourist trade. — All parts of Italy are inviting to tourists. Many persons go there in winter partly on account of the mild climate; and there are many other inducements to visit the country at all times. The scenery everywhere is of great beauty, from the Italian lakes among the Alps to the Bay of Naples and the mountains of Sicily. Since Rome was long the center of the civilized world, its ancient ruins, including the Forum and the Colosseum in particular, are of great interest. So also are other historic ruins in many parts of the peninsula.

Many European countries are proud of their beautiful buildings and art treasures. In this respect Italy has especial cause for pride. The magnificent cathedral at Milan is one example of Italian architecture; St.

Peter's at Rome, the largest cathedral in the world, and the Vatican, where the Pope resides, are others. In Rome and Florence there are many noted paintings and pieces of sculpture, and similar art treasures are found in many other places. The entertainment of tourists is, therefore, as in Switzerland, one of the important means of livelihood for the inhabitants.

Recent attempts of Italy to improve her condition. — In recent years Italy has taken two important steps to improve her condition. As a result of a war with Turkey she obtained, in 1912, full control of Libia, formerly called Tripoli, across the Mediterranean in northern Africa. In Fig. 495 estimate its distance from Italy. Look up its area and population on p. 480. Its exports are sponges, ivory, and ostrich feathers, the last two named being brought from the lands to the south of the Sahara by caravan. Much of it is desert and it remains to be seen how valuable it will prove as a producer of food and raw materials for manufacture. What other possessions has Italy in Africa (Fig. 473)?

Acquisition of new territory

As a result of the World War, also, Italy has increased her control of the Adriatic Sea, the eastern outlet for the fertile Po Valley. What other outlet by water could the trade of the Po Valley follow if the Adriatic were closed to it?

Improved control of the Adriatic and Aegean

Name the countries that border upon the Adriatic Sea. Fig. 385 shows a very noticeable difference between its eastern and western coasts. Note how straight the coast line is on the Italian side. In all that distance there are only two ports of importance, Venice and Brindisi. Locate Brindisi. On the other hand, note how irregular the eastern coast line is. It has many good harbors. During the World War, Austria established naval bases there and operated submarines against Italy from behind the barrier of islands.

Italy determined to prevent such attacks in the future. She got control of a strip of land on the east coast of the Adriatic, including the port Trieste. Does the map (Fig. 386) suggest to you why it is natural that Yugoslavia should object to a southward extension of Italian influence on this coast? As a result of the war, Italy also got control of several important islands, including Rhodes, off the coast of Asia Minor. In 1924 she obtained Fiume.

Facts to be especially well fixed. — 1. Names and location of the principal mountains. 2. Of the largest river. 3. Location of the following cities: Rome; Venice; Milan; Turin; Florence; Naples; Genoa; Trieste. 4. Location of Sicily and Sardinia. 5. Climate of Italy. 6. Principal farm products. 7. Principal minerals and manufactures.

Problems for independent study. — 1. Prove that there are less than two acres of land per person in Italy. 2. Our Italian immigrants have come mainly from the southern half of Italy. Why from that section? Winslow, I. O.: *Europe*, pp. 129–130 (Heath); Smith, J. R.: *Commerce and Industry*, p. 416 (Henry Holt); Encyclopædia Britannica, vol. XV, p. 8; Adams, C. C.: *A Textbook of Commercial Geography*, p. 292 (Appleton). 3. Find out why malaria exists in so much of Italy and what measures are necessary to stamp it out. 4. The rivers of Italy transport an unusual amount of sediment; for instance, the Tiber is commonly called the Yellow Tiber from the amount of silt it carries. Find an explanation for this fact, and show how the deposits of sediment have affected the river mouths. Encyclopædia Britannica, vol. XXVI, p. 913; Chamberlain, J. F., and Chamberlain, A. H.: *Europe*, rev. ed., Chapter XVII (Macmillan). 5. We learned that water power is used to great advantage in northern Italy. What reasons can you suggest for its not being extensively used in the peninsula of Italy? Encyclopædia Britannica, vol. XV, p. 4. How does this affect manufacturing?

6. Why is Genoa a more important outlet for the Po Valley than Venice? 7. Debate the question: Should Italy control the Adriatic Sea? 8. If you wanted to visit Italy, what points of interest would you choose to see? National Geographic Magazine, vol. 30, pp. 273–284; Chamberlain, J. F. and A. H.: *Europe*, rev. ed., Chapter XVII (Macmillan); Winslow, I. O.: *Europe*, pp. 131–138 (Heath); Carpenter, F. G.: *Europe*, Chapters LVII–LXIII (American Book); Finnemore, G.: *Peeps at Many Lands: Italy* (Macmillan). 9. Read Browning's poem "Pippa Passes," which tells about a little silk weaver who lived in Asola, Lombardy, one of the chief homes of the silk industry.

V. Countries of the Danube and the Balkans

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Albania	Republic	17,400	832,000	Scutari	32,000
Austria	Republic	32,400	6,536,000	Vienna	1,866,000
Bulgaria	Limited monarchy	39,800	5,034,000	Sofia	154,000
Czechoslovakia	Republic	54,200	13,613,000	Prague (Praha)	677,000
Greece	Republic	49,100	6,200,000	Athens	385,000
Hungary	Limited monarchy	35,900	8,275,000	Budapest	1,185,000
Rumania	Limited monarchy	122,300	17,393,000	Bucharest	309,000
Turkey in Europe	Republic	10,900	1,870,000	Constantinople	881,000
Yugoslavia (Serb, Croat, and Slovene State)	Limited monarchy	96,100	12,017,000	Belgrade	112,000

The rank of these countries among the nations. — More than 2,000 years ago Greece was the leading country in the world. Its position between the western shores of the Mediterranean and the older civilizations of Egypt and southwestern Asia made it the connecting link between the two. Its irregular coast, with its many excellent harbors, favored the development of an extensive commerce on the sea and the settlement of a large number of colonies at various points along the Mediterranean coast.

Importance of Greece in ancient times

The chief center of this activity was Athens, located six miles inland from its port, Piræus. Athens developed a wonderful knowledge of architecture, sculpture, and poetry. The ruins of scores of its statues now border some of its principal streets, and the remains of some of its finest buildings are still to be seen on the Acropolis (Fig. 390), a level-topped rocky hill with steep sides, at the edge of the city. Athens is now a thriving city of nearly 400,000 inhabitants, and the capital of Greece; but to most of the visitors from all parts of the world these reminders of the distant past are its principal attraction.

Greece and neighboring countries to the north were later conquered by the Romans, and still later by the Turks. The center of European civilization then shifted to the northwest; England, France, and Germany became the leading powers. Fig. 294 shows how much more densely populated those countries are to-day than this southeastern section of the continent. In agriculture, in mining, and in manufacturing these countries are still among the most backward of Europe. Yet in recent years the Balkan Peninsula (Fig. 386) has been very important in Euro-

Importance of these countries in recent years

pean politics; and the other countries of Europe have watched it almost as though it were still the center of the world's activity. We shall see later why these states, in many ways far from prosperous, have figured so prominently in world affairs.

© Brown and Dawson

Fig. 390. — Athens, from the Acropolis

The Acropolis is a rocky hill which was used as the citadel of the ancient city. The ruins of the *Parthenon* and other temples here form some of the most imposing remains of the ancient world.

Why these countries are backward in agriculture. — A glance at the map (Fig. 386) shows how unfavorable their surface is for agriculture; for most of it is mountainous, a wild scramble of mountain ranges inclosing many short basins and narrow valleys. The loftiest of all are the Tyrol Alps in western Austria, whose highest peaks reach an altitude of from 12,000 to 13,000 feet. The Dinaric Alps, running parallel to the Adriatic Sea, are much lower, as are also the Transylvanian Alps and the Carpathians. The Balkan Mountains, extending east and west through Bulgaria, are the range after which the region south of the Danube River has been named, the countries there being often called the Balkan States. Name and locate them. Locate also the various mountain ranges just referred to.

Disadvantages of their surface for agriculture

© Keystone View Co., Inc.

Fig. 391. — A lake in the Tyrol Alps

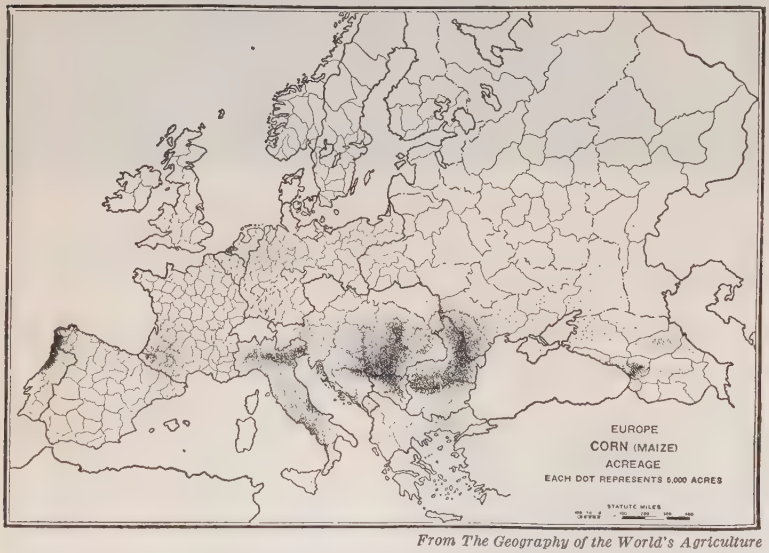
The scenery in the Tyrol Alps is quite as beautiful as that in Switzerland, but the region is difficult to reach because there are few railways.

In all this area there are only two great level surfaces: one, the plains of Hungary; and the other, those of Rumania. Both of these, because of the light rainfall, remind one of our Middle

Western plains, and permit farming on an extensive scale. Much of the surface in other places is occupied by forests, the farming being confined largely to narrow valleys.

The temperature and rainfall vary greatly. The temperatures of the lands close to the Mediterranean are moderated by the sea; Greece, situated far to the south, has temperatures like those of eastern North Carolina. In what temperature region is Greece (Fig. 290)? The mountains confine the influence of the Mediterranean to a very narrow belt, and the vast area farther north and east suffers from cold winds and deep snows. In what temperature region are these sections? Cold north winds produce such violent changes in temperature that boats on the rivers and canals are often caught on late trips in the fall and frozen in for the winter. The plains in the east receive the full sweep of these winds; on that account Constantinople cannot grow the olive, while northern Italy and France, much farther north, raise abundant crops of olives.

Disadvantages of their climate



From The Geography of the World's Agriculture

Fig. 392

The rainfall in most of this territory is reasonably favorable to agriculture (Fig. 291). The amount decreases toward the extreme east, however, so that eastern Rumania and Bulgaria are devoted principally to grazing. In the southern half of this region most of the rains come in winter (p. 286). On this account Greece can produce very little indeed without irrigation.

On the great plains of Hungary and Rumania the principal crop is wheat (Fig. 368); but other grains, including oats, rye, barley, and corn (Fig. 392), are extensively grown. All these grains, as well as sugar beets (Fig. 335) and hops, are raised in large quantities in Czechoslovakia; and potatoes and other root crops, as well as plums and other fruits, are produced in most of these countries. Prunes are exported in large quantities.

The principal crops

In the southern and western sections, where the climate is mild, mulberries, grapes, olives, oranges, and lemons are especially common. Greece is noted for its currants, which are small seedless grapes that have been dried. In southern Bulgaria the cultivation of roses is a special industry. In a section protected by the Balkan Mountains from the north winds, as many as 18,000 acres have been devoted entirely to rosebushes. The inhabitants of 200 villages are occupied with their cultivation, the petals of the roses being the valuable part. One acre grows about 4,000 pounds, and 200 pounds of petals produce one ounce of the perfume Attar of Roses. Can you see, therefore, why

this perfume is extremely expensive? Bulgaria manufactures about half of the world's supply.

In many places unsuited to agriculture, grazing of cattle (Fig. 305), sheep (Fig. 306), horses, and goats is the chief occupation; and swine (Fig. 336) roam the forests in great numbers, feeding on acorns and beechnuts.

© Keystone View Co., Inc.

Fig. 393. — A landscape in Bulgaria

This view was taken looking south from the Balkan Mountains toward Sofia. The lands are held by the peasants in small plots, on which they raise many products similar to those grown in the eastern part of the United States. Do you see any resemblance to a New England landscape?

Throughout these countries lack of education is a great obstacle to success in farming. In western Czechoslovakia, however, the schools have been excellent, as is shown by the fact that among the Czech immigrants to the United States illiteracy has been lower than in any other nationality. Elsewhere, however, education is not so general, and in many sections it is extremely meager. The difficulty is that most of this region, especially the southern portion, was ruled for hundreds of years and until quite recently by the Turks, who did not favor schools and roads. Less than forty per cent of the population of Rumania can read; in Albania until about 1912 only three short highways had been built since the time of the Roman Empire, and these had not been kept up. Transportation in that country has been carried on almost entirely by pack animals over mountain trails.

How want of education retards production

In such conditions, which prevail in most sections except in Czechoslovakia and Austria, farming must suffer. On the large estates, containing thousands of acres, of which there are many, the highest intelligence and skill are sometimes shown. One finds upon them modern farm machinery; the soil is abundantly fertilized, and rotation of crops is carefully planned. In the same locality, however, there is often an equal area of farm land occupied by hundreds of peasants, each of whom holds only a few acres and rejects every modern improvement. They cut grass with sickles, rake it by hand, and haul it on oxcarts; they neglect fertilization of the soil, and know nothing about rotation of crops. Worse still, many peasants will not learn, because they are deeply prejudiced against any change. Thus the farm products are much less than they ought to be.

Why mining and manufacturing are not well developed. — Mining and manufacturing are also little developed, although they are important in some districts. They are most extensive in western Czechoslovakia, because coal is abundant south and west of Prague, iron ore is near by, and the people are intelligent. These raw materials are the basis of a great iron and steel industry in Prague and neighboring

The leading mining and manufacturing centers

centers. In addition, a large amount of beet sugar comes from this quarter; the manufacture of pottery is extensive; and a kind of sand found in this region has led to the manufacture of the renowned Bohemian glassware.

Fig. 394. — Prague

The Hradcany, occupying the heights shown in the background of the picture, is a famous Bohemian citadel, in which some of the government offices of Czechoslovakia are now housed. Within its inclosure are the old castle of the former kings of Bohemia, an ancient cathedral, fortress towers, and other buildings.

In Austria there are iron and coal deposits that have been worked for 2,000 years without becoming exhausted, and water power is abundant. These resources, together with timber near at hand, have made Vienna an important manufacturing center. Metal working, furniture making, the tanning of leather, and the spinning and weaving of textiles give support to a large population. Many of the products are peculiarly artistic, like those of France (p. 315) and Italy (p. 371), and on that account command a high price.

Budapest is a great flour-milling center. Most of the manufactures of the city and its vicinity consist of the preparation of agricultural products for the market, including flour-milling, beet-sugar refining, brewing, and distilling. Rumania produces a large amount of petroleum.

Aside from these few centers for mining and manufacturing, the industries are poorly developed. One might expect an exception in the case of Constantinople, since great cities usually owe their size largely to manufacturing; but the Turks have opposed factories for much the same reason that they have objected to schools and roads. Their attitude toward factory products is illustrated by their backwardness in city improvements. Only since 1909 have electric lights, telephones, steam heat, and trolley cars begun to be introduced extensively into their capital.

The small extent of mining and manufacturing outside of these centers

With the few exceptions mentioned, manufacturing in these countries is primitive. The mass of the people are too ignorant even to feel the need of many things that we regard as daily necessities. Beyond a few textiles and very simple metal implements, the wants of the average peasant family have to be met by what they can make in their own homes.

The far-reaching importance of the position of these countries. — The real reasons for the importance of these countries are found outside of their industries. One of them is their

location. The two most populous continents are Asia and Europe; the principal land route between them leads directly across these states. To pass from one continent to the other between the Black Sea and the Caspian is made difficult by the presence of an extensive mountainous area. Name these mountains. To pass just north of the Caspian Sea one would have to travel through vast and thinly populated arid areas. Therefore, the route across the outlet from the Black Sea to the Mediterranean is practically the only one for most of the traffic between the continents.

Their control of the land route between Europe and Asia

The strait of the Dardanelles is about forty miles in length and varies in width from a little less than one mile to five miles; but the Bosporus, which is twenty miles long, is less than a third of a mile wide at its narrowest point. This is the place, then, where the land traffic between two great continents must pass; and this explains the location of Constantinople.

From that city the easiest way to western Europe is through Adrianople, Sofia, Nish, Belgrade, Budapest, Vienna, Prague, and thence on to Berlin. Note how many of these cities are capitals. Name the country to which each belongs. Ages ago this was the main road for marching troops, and now, of course, a railway covers the entire distance.

Another route across Europe from the southeast starts at Saloniki, the second largest city of Greece, and connects with the main line at Nish in eastern Yugoslavia. Saloniki ranks next to Constantinople and Athens in importance as a port. It served as the headquarters of the Allied armies in southeastern Europe during the World War.

© *E. M. Newman*

Fig. 395. — A portion of the harbor at Constantinople

The Golden Horn, an arm of the Bosporus, is an excellent harbor and, with the Bosporus itself, affords a large area for anchorage. The small vessels shown in the picture are coasting vessels that bring food and other products from the lands bordering the three seas between Europe and Asia. Name these seas (Fig. 386).

The Danube River also forms an important waterway for slow freight or for heavy and bulky articles such as lumber, grain, oil, and salt. Formerly rocks in its bed at Iron Gate, the point where the river passes through the Transylvanian Alps, made navigation dangerous; but these have been blasted out and the way is now clear for good-sized boats. On the map, trace the Danube to its source, and note the importance of this waterway for traffic across Europe.

Their control of the Danube waterway

Owing to their location, therefore, these

© *Keystone View Co., Inc.*

Fig. 396. — Sarajevo, in western Yugoslavia

This city lies in a valley in the Dinaric Alps. What event of far-reaching importance happened here in 1914?

southeastern countries form a sort of bridge between Asia and the busy part of Europe, and thus control these three important routes.

The danger of war in this region has been another reason for its importance, for it has been the scene of constant turmoil. While there are many races in the peninsula, all suspicious of one another, no one nation has been composed of a single race, and people of each race have always dwelt in territory ruled by another. Slavs have been ruled by Austrians; Rumanians by Hungarians; and Turks, Greeks, and Serbs by Bulgarians. Differences in religion have increased the general distrust. Hardly any of the boundaries between countries have been natural. Examine them to see. They merely mark the limits of force in the past, and suggest its use in the future. There has been repeated shifting of frontiers in the last few decades. Finally, while none of the nations has been at all backward in mischief, the Turks have been especially noted for their cruelty, untrustworthiness, and ingenuity in stirring up trouble. Such conditions partly explain why this region has been called the powder box of Europe.

The danger of war

1. Among these nations themselves

There is more to the explanation, however, for the larger nations of Europe have also meddled here. Russia has long wanted a free outlet from the Black Sea past Constantinople to the Mediterranean and Atlantic. Since this was impossible so long as Turkey controlled the Bosporus, it was but natural that Russia should form alliances with some of these countries, with the ultimate object of obtaining command of the strait by force.

2. Among the other European nations

Meanwhile Germany was ambitious to control the railway from Berlin to Constantinople with the idea of extending it even to Baghdad in Mesopotamia, where the undeveloped country might furnish inviting homes to millions of persons from crowded Germany. The Berlin-to-Baghdad railway

Fig. 397. — Bosporus and the Dardanelles

became a favorite scheme of Germany; and since it could hardly be carried out by her alone, it was natural that she should try to attract some of these southeastern countries to her side with the purpose of putting it through by force.

Britain could not ignore these ambitious plans. She commanded the western outlet of the Mediterranean at Gibraltar, as well as the eastern outlet through the Suez Canal. Consequently, if Russia obtained free access to this sea, there might be trouble about these outlets; nor was such an increase in the advantages of so great a rival desirable. Again, not far beyond the Baghdad terminus of the proposed Berlin-to-Baghdad railway were the Persian Gulf and British India (Fig. 495); and the extension of German power to a point so near British territory would be a direct threat against British power. Hence Britain was almost compelled to try to defeat these projects of Russia and Germany by taking some of these southeastern countries under her protection. No wonder, then, that the eyes of the whole world have long been directed with anxiety to this section. It was a powder box even with a fuse attached, all ready to be lighted. And the match was applied in July, 1914.

What steps have been taken to avoid Balkan wars in the future? — What steps have been taken to prevent similar catastrophes in the future? There are at least five.

One is the change of government in Turkey. A republic was declared in 1923 with its capital at Angora instead of at Constantinople. Turkish territory in Europe remains about as before, but with their capital transferred to Asia Minor the Turks are now chiefly interested in their Asiatic territory.

Second, the boundaries of these countries have been altered so as to bring under one government, as far as possible, those people who speak the same language and represent the same race. This has caused very great changes, and has led to the formation of some new countries. Compare Fig. 287 with Fig. 331. Austria has less than a third of its former area and population; Hungary is much smaller than it used to be, and Rumania much larger. Name the new nations and trace their boundaries. Which one includes the former country called Serbia? There is likely to be less discontent in this region in the future, and it is to be hoped that there will be less war on that account.

Third, the two principal water routes, the Danube River and the outlet from the Black Sea to the Ægean, through the Dardanelles and the Bosporus, are now internationalized. This means that they are open to all nations for use on equal terms, and no one of them now has the right to interfere with another in the transportation of goods. That provision again removes a cause of much bad feeling.

Fourth, many of the nations of the world, large and small, have formed a league, called the *League of Nations*, one of whose aims is to prevent war in the future. How fully it will succeed remains to be seen. Yet an association of nations of some kind must finally succeed; for war is a horrible and unnecessary thing, and human beings must develop sense enough to abolish it.

Finally, in 1923, by the Treaty of Lausanne demilitarized zones were established on Turkey's European frontier, on both sides of the Dardanelles and the Bosporus, and throughout the extent of certain islands in the Ægean Sea and the Sea of Marmora; this means that military forces and equipment, fortifications, and other things pertaining to war are prohibited in these zones.

Facts to be especially well fixed. — 1. The temperature regions in which each country lies. 2. The amount of rainfall in the different sections and the season in which it occurs. 3. Location of Prague; Vienna; Budapest; Belgrade; Bucharest; Sofia; Constantinople; Athens; Saloniki. 4. Names of the countries in southeastern Europe and location of each. 5. The principal routes of travel and transportation through these countries. 6. Their surface features. 7. Principal farm products. 8. Principal mining and manufacturing centers.

Problems for independent study. — 1. Make a drawing of the Berlin-to-Constantinople railway, showing the location of the principal cities through which it passes. Packard, L. O., and Sinnott, C. P.: *Nations as Neighbors*, p. 320 (Macmillan); Journal of Geography, vol. 16, pp. 69–72. 2. Make a drawing of the outlet from the Black Sea to the Ægean Sea and show the location of Constantinople. 3. What kinds of freight bound from Rumania or Bulgaria to London would probably be shipped by way of the Mediterranean rather than westward by the Danube and Rhine rivers? 4. Does Athens or Saloniki have the greater prospect for growth in the future? Why? Robinson, E.: *Commercial Geography*, pp. 365, 367–368 (Rand McNally); National Geographic Magazine, vol. 39, pp. 185, 195; vol. 30, pp. 203–205; Chamberlain, J. F., and Chamberlain, A. H.: *Europe*, rev. ed., Chapter XIII (Macmillan). 5. Here is a subject for debate: *Resolved*, that the Danube River is more important for commerce than the Rhine. Carpenter, F. G.: *Europe*, pp. 292–323 (American Book); Allen, N. B.: *Industrial Studies: Europe*, pp. 202–220 (Ginn). 6. Why are goats especially common in these states? 7. Name the side that each of the Balkan countries shown in Fig. 331 took in the World War and state some of the reasons for that choice. 8. It was generally expected that the Turks would be entirely expelled from Europe as a result of the war. Why was that not done? World Book, vol. 8, p. 5907.

PART V. ASIA

I. General Facts

Extent and distribution of population. —If Asia contained no more inhabitants per square mile than North America, it would have a much larger population than our continent, for it has nearly twice the area. It has, in fact, six times as large a population, over 970,000,000, or about one half of all the people in the world.

Unfortunately they are very unevenly distributed. In Fig. 403 you see that much more than one half of the continent is thinly settled, while two large sections are almost entirely black with dots, each dot representing 100,000 persons. What are these two sections? Find out the population of each (p. 477). What are some of the questions that occur to you as you look at this population map?

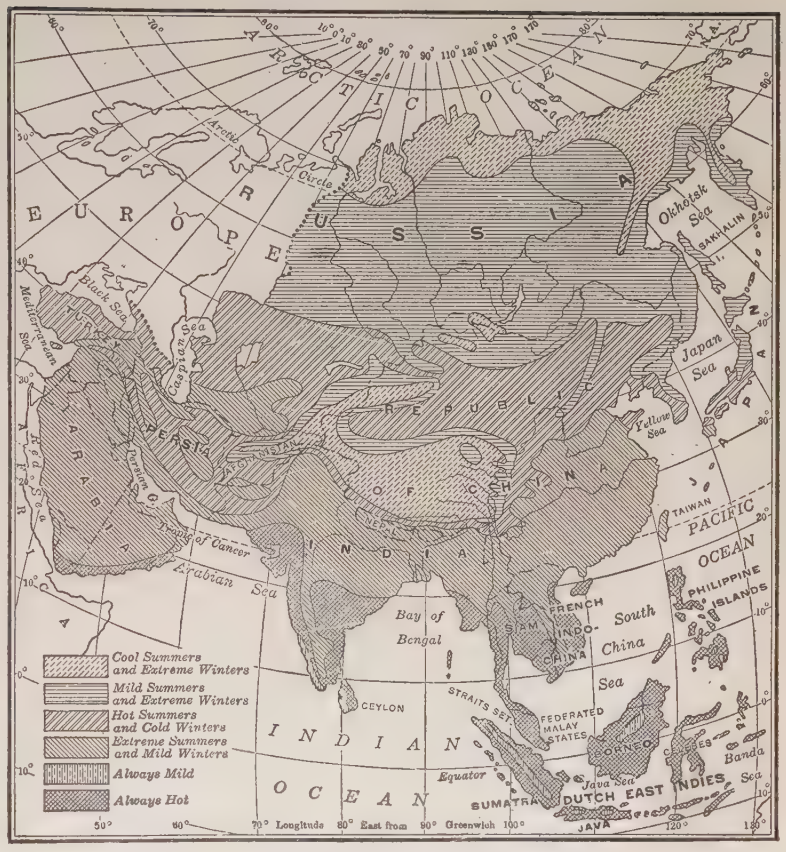


Fig. 398. — The temperature regions of Asia

Why the population is so unevenly distributed. — Fig. 398 suggests some of the reasons for this uneven distribution of population. If you will examine the population map of North America (Fig. 10), you will find that there are very few inhabitants north of the 50th parallel of latitude. This is on account of the cold. Fig. 398 shows more than a third of Asia also to have *cool summers and extreme winters* or *mild summers and extreme winters*. Largely on account of

How the temperature affects its distribution

Questions on Fig. 399. — 1. Compare the area over 10,000 feet in elevation in extent with that in North America; in South America; in Europe. 2. Compare the desert areas indicated on this map with the areas of light rainfall shown on Fig. 401. Do they agree? 3. What would you expect to be the value of the Yenisei and Lena rivers for navigation? Of the Yangtze? 4. What indication do you see that Asia was once connected by land with North America and, through the East Indies, with Australia?

ASIA
PHYSICAL MAP
Scale of statute miles
0 250 500 1000 1500
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
Below sea level
DEPTHS IN FEET
Sea level to 5000
Below 5000
Longitude East from Greenwich
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
EUROPEAN PLAIN
SIBERIAN PLAIN
Tundra
EUROPEAN URAL MTS.
STANOVOI MTS.
Kirghiz Steppes
CENTRAL ASIA BASIN
PLATEAU OF IRAN
PLATEAU OF MONGOLIA
Gobi Desert
TIEN SHAN
KUEN LUEN MTS.
PLATEAU OF TIBET
HIMALAYA MTS.
Tarim Basin
Turfan Depression
Lob Nor
Mt. Godwin Austen
Mt. Everest
Kaisabar Pass
PAMIR PLATEAU
Thar Desert
Great Arabian Desert
Arabian Desert
Syrian Desert
Gulf of Oman
Persian Gulf
Gulf of Aden
Red Sea
Dead Sea
Caspian Sea
Black Sea
Aral Sea
Lake Baikal
Lake Balkash
Indus R.
Ganges R.
Brahmaputra R.
Yangtze R.
Si R.
Yellow Sea
East China Sea
South China Sea
Sea of Japan
Java Sea
Celebes Sea
Timor Sea
Bay of Bengal
Arabian Sea
Tropic of Cancer
Tropic of Capricorn
Equator
Arctic Circle
Bering Strait
Gulf of Anadir
Sea of Okhotsk
Kara Sea
Nordenskiold Sea
Baltic Sea
Mediterranean Sea
Suez Canal
Strait of Malacca
Strait of Makassar
Sunda Islands
Philippine Islands
Japan
Hokkaido
Honshu
Kyushu
Shikoku
Taiwan (Formosa)
Hainan
Borneo
Sumatra
Java
Celebes
Ceylon
Madagascar
Australia
Sakhalin Island
Kuril Islands
Nansei Islands
Laccadive Islands
Maldive Islands
Andaman Islands
Nicobar Islands
Amirantes Is.
Seychelles Is.
Chagos Islands
Sokotra I.
Cyprus
Crete
Spitzbergen
Franz Josef Land
New Siberian Islands
Novaya Zemlya
Iceland
North America
Asia Minor
Caucasus Mts.
Elburz Mts.
Zagros Mts.
Taurus Mts.
Kurdistan Highlands
Armenian Highlands
Plateau of Asia Minor
Plateau of Armenia
Plateau of Elburz
Plateau of Kosdo
Altai Mts.
Stanovoi Mts.
Kamchatka Peninsula
Mongolian Plateau
Plains of Manchuria
Korea Peninsula
Indo-China Peninsula
Malay Peninsula
Western Ghats
Plateau of Dekkan
Eastern Ghats
Ganges Plain
Irrawaddy R.
Mekong R.
Yenisei R.
Ob R.
Lena R.
Amur R.
Volga R.
Irtish R.
Sungari R.
Hwang-ho R.
Fuji Mt. 12,390 ft.
Mt. Ararat 16,916 ft.
Mt. Elburz 18,600 ft.
Mt. Kosciusko 7,328 ft.
Mt. Kinabalu 13,698 ft.
Mt. Apo 9,690 ft.
Mt. Pulog 9,606 ft.
Mt. Semeru 12,060 ft.
Mt. Kerinchi 12,467 ft.
Mt. Ophir 13,455 ft.
Mt. Dempo 10,340 ft.
Mt. Slamat 11,247 ft.
Mt. Rinjani 12,224 ft.
Mt. Tambora 9,340 ft.
Mt. Agung 10,308 ft.
Mt. Lawu 10,760 ft.
Mt. Merapi 9,720 ft.
Mt. Sumbing 11,240 ft.
Mt. Slamat 11,247 ft.
Mt. Kerinchi 12,467 ft.
Mt. Ophir 13,455 ft.
Mt. Dempo 10,340 ft.
Mt. Rinjani 12,224 ft.
Mt. Tambora 9,340 ft.
Mt. Agung 10,308 ft.
Mt. Lawu 10,760 ft.
Mt. Merapi 9,720 ft.
Mt. Sumbing 11,240 ft.
Mt. Slamat 11,247 ft.
Mt. Kerinchi 12,467 ft.
Mt. Ophir 13,455 ft.
Mt. Dempo 10,340 ft.
Mt. Rinjani 12,224 ft.
Mt. Tambora 9,340 ft.
Mt. Agung 10,308 ft.
Mt. Lawu 10,760 ft.
Mt. Merapi 9,720 ft.
Mt. Sumbing 11,240 ft.
1926 WILLIAMS ENGRAVING CO., N.Y.

Fig. 399

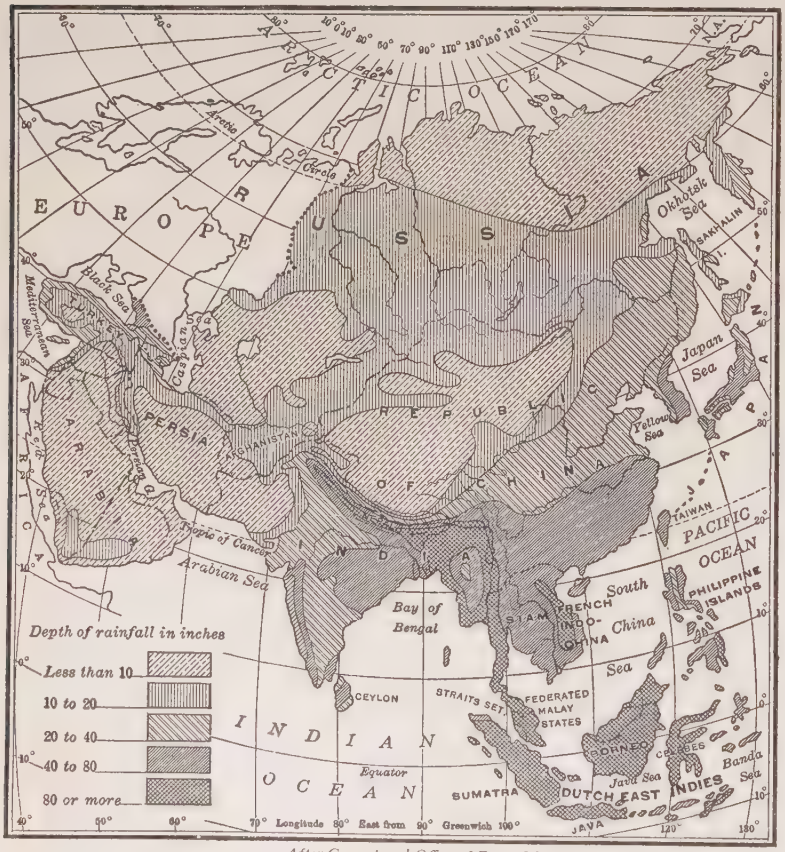
ASIA
POLITICAL MAP
Scale of statute miles
0 250 500 1000 1500
Capitals ◎
Railroads
Canals
Longitude East from Greenwich
UNION OF SOVIET SOCIALIST REPUBLICS
EUROPEAN RUSSIA
SIBERIA
ARCTIC OCEAN
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
Constantinople
Moscow
Leningrad
Kiev
Odessa
Volga R.
Ural Mts.
Caucasus Mts.
Black Sea
Caspian Sea
Aral Sea
Lake Baikal
Yenisei R.
Lena R.
Amur R.
Yangtze R.
Yellow R.
Tokyo
Yokohama
Osaka
Kyoto
Nagoya
Hakodate
Vladivostok
Harbin
Mukden
Peking
Tientsin
Shanghai
Hankow
Changsha
Canton
Hongkong
Foochow
Nanking
Taiyuan
Urga
Tihwafu
Turfan
Lop Nor
Tarim R.
Kashgar
Yarkand
Khotan
Aksu
Tashkent
Samarkand
Bokhara
Semipalatinsk
Omsk
Tomsk
Irkutsk
Yakutsk
Verkhoyansk
Krasnoyarsk
Nikolayevsk
Khabarovsk
Blagoveshchensk
Okhotsk
Petropavlovsk
Sakhalin Island
Kamchatka
Bering Strait
C. Deshnef
C. Chelyuskin
Nordenskjold Sea
New Siberian Islands
Wrangel I.
Franz Josef Land
Spitzbergen
Iceland
North Cape
Barents Sea
Kara Sea
Nova Zembla
Baltic Sea
Gulf of Bothnia
Helsingfors
Stockholm
Arctic Circle
Tropic of Cancer
Tropic of Capricorn
Equator
Baghdad
Teheran
Ispahan
Mecca
Medina
Riad
Jidda
Aden
Gulf of Aden
Gulf of Oman
Persian Gulf
Red Sea
Arabian Sea
Mesopotamia
Syrian Desert
Great Arabian Desert
Asia Minor
Palestine
Afghanistan
Herat
Kabul
Khyber Pass
Peshawar
Khelat
Gwadar
Karachi
Maskat
Hyderabad
Bombay
Calcutta
Madras
Delhi
Agra
Lucknow
Allahabad
Benares
Lahore
Gartok
Lassa
Mt. Everest
Himalaya Mts.
Nepal
Bhutan
Sikkim
Darjeeling
Rangoon
Mandalay
Bay of Bengal
Andaman Islands
Nicobar Islands
Ceylon
Colombo
Pondicherry (Fr.)
Karikal (Fr.)
Yanaon (Fr.)
Mahe (Fr.)
Panjim
Bangalore
Laccadive Islands
Maldive Islands
C. Comorin
C. Guardafui
Socotra I.
Aden
Mocha
Hodeida
Hadhramaut
Yemen
Muscat
Karachi
Chandernagor (Fr.)
Nagpur
Bombay
Hyderabad
Goa (Port.)
Diu (Port.)
Rhorya Morya Is. (Br.)
Seychelles Is. (Br.)
Amirantes Is. (Br.)
Chagos Is. (Br.)
Madagascar
Africa
Australia
Tropic of Capricorn
Indo-China
Siam
Bangkok
Saigon
Hue
Hanoi
Haiphong
Gulf of Siam
Malay Peninsula
Cambodia
Annam
Tonkin
Hainan
Yunnan
Kwangchow (Br.)
Macao (Port.)
Taiwan (Formosa)
Philippine Islands
Luzon I.
Manila
Samar I.
Mindanao I.
Sulu Sea
Palawan
Celebes Sea
Borneo
North Borneo
Brunei
Sarawak
Federated Malay States
Singapore
Sumatra
Banka
Billiton
Palembang
Banjermasin
Java Sea
Batavia
Java
Sumatra
Dutch East Indies
Banda Sea
Timor I.
Timor Sea
Flores I.
Celebes
Gilolo
Ceram I.
Amboina
Straits Settlements
Malacca
Straits of Malacca
Straits of Johore
Christmas I. (Straits Set.)
Cocos Is. (Straits Set.)
Williams Engraving Co., N.Y.

Fig. 400

Questions on Fig. 400. — 1. There are fewer separate countries in Asia in proportion to its size than in any other continent except Australia. Show that this is true. 2. Compare the latitude of the chief cities, as shown by the heavy type, with that of most large cities in North America; in Europe. 3. This map affords a good illustration of the fact that *up* on a map is not always *north*. What direction on this map is *north* from Bering Strait? Why? 4. What important political boundaries in Asia are natural? Show that the proportion of natural boundaries in Asia exceeds that in North America.

the cold, there are few inhabitants above the 50th parallel of latitude on that continent also (Fig. 403).

Fig. 398 shows another area in the south central part of the continent that has *cool summers and extreme winters*. The map (Fig. 399) indicates that this is a vast highland with an elevation of more than 10,000 feet. On the southern side are the Himalaya Mountains, whose loftiest peak, Mt. Everest, is the highest in the world (29,002 feet). Locate it. There are many other ranges, also, with peaks rising above plateaus that themselves lie more than 10,000 feet above sea level, or higher than most mountains. Such a plateau is Tibet, which has an elevation of 10,000 to 15,000 feet. One can understand, therefore, why the dense population of India does not extend north of the Himalayas.



After Gannet and Office of Farm Management, U. S. Dept. of Agric.

Fig. 401. — Annual rainfall in Asia

Clearly, most of Asia is arid or semi-arid. Since Asia north of about the 35th parallel of latitude is in the belt of westerlies, show why the rainfall is so light. For the explanation of the heavy rainfall in the neighborhood of the Himalayas, see p. 240.

How the rainfall affects its distribution

The distribution of rainfall also has a great influence on the distribution of the population. In Fig. 401 you find a very extensive area, extending from the Red Sea northeastward to the Arctic Ocean and Bering Sea, that receives less than twenty inches per year. This region is therefore too dry for ordinary agriculture. What countries or parts of countries lie in this area? Fig. 401 shows what a large part is desert and semi-desert. This includes all of southwestern Asia and two other vast areas besides. By referring to Fig. 242 you can discover some reasons for this lack of rain. State them. Note how large

or small is the population in these arid and semi-arid regions. What do you observe about the number and size of rivers here? What conclusions do you draw about the need of irrigation in Asia? What do you observe about the density of population in areas whose rainfall is at least forty inches?

Races to which the people belong, and their religions. — Three fourths of the people of Asia belong to the Mongolian division of the human race, among whom are the Chinese and the Japanese. Their color is yellow. The remaining fourth are whites.

There are great differences in religion between most of these peoples and ourselves. Although the Christian religion started in the part of southwestern Asia called Palestine and spread freely about the Mediterranean, it made little headway across the desert and mountainous lands to the east. At present two thirds of the Asiatic people are either Brahmans or Buddhists, as their ancestors have been for many centuries. Many others are of the Mohammedan faith, which had its start in Asia long after Christ lived. This religion has not only become established in most of southwestern Asia, but has spread even over the arid region far to the eastward.

Early progress of the people, and their present backwardness. — Asia was the seat of some of the earliest civilizations of mankind. Indeed we owe much to the people that lived in that continent thousands of years ago. For example, no one knows who it was that first tamed such animals as the horse, dog, and sheep; nor is it known who first cultivated wheat and many other useful plants; but it is certain that the people of Asia knew the value of all these much earlier than the Europeans. Centuries before the time of Christ, the people of India grew cotton and wove it into cloth, and kept sheep, cattle, horses, and goats. The first silks came from Asia. Tea was introduced into Europe from China, and India was the early home of the lemon tree and the orange.

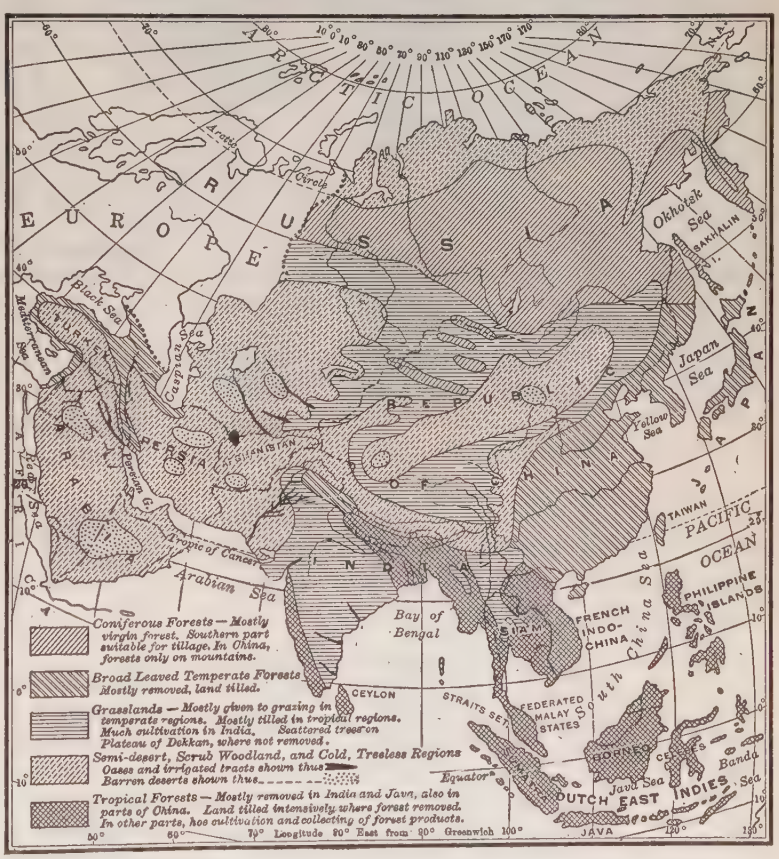

ARCTIC OCEAN
EUROPE
ASIA
Arctic Circle
Black Sea
Caspian Sea
Mediterranean Sea
ARABIA
PERSIA
AFGHANISTAN
Persian G.
Tropic of Cancer
Arabian Sea
INDIA
Bay of Bengal
CEYLON
STRAITS SET.
FEDERATED MALAY STATES
FRENCH INDO-CHINA
SIAM
BURMA
REPUBLIC OF CHINA
Okhotsk Sea
SAKHALIN
Japan Sea
Yellow Sea
TAIWAN
PACIFIC OCEAN
PHILIPPINE ISLANDS
South China Sea
BORNEO
CELEBES
Banda Sea
Java Sea
DUTCH EAST INDIES
JAVA
Equator
Coniferous Forests — Mostly virgin forest. Southern part suitable for tillage. In China, forests only on mountains.
Broad Leaved Temperate Forests Mostly removed, land tilled.
Grasslands — Mostly given to grazing in temperate regions. Mostly tilled in tropical regions. Much cultivation in India. Scattered trees on Plateau of Dekkan, where not removed.
Semi-desert, Scrub Woodland, and Cold, Treeless Regions Oases and irrigated tracts shown thus Barren deserts shown thus
Tropical Forests — Mostly removed in India and Java, also in parts of China. Land tilled intensively where forest removed. In other parts, hoe cultivation and collecting of forest products.
50° 60° 70° Longitude 80° East from 30° Greenwich 100° 120° 130°

Fig. 402. — The plant regions of Asia

In what temperature belt is the cold treeless region? In what countries are there deserts and semi-deserts? Where are the coniferous forests? How does their extent compare with that of similar forests in North America (Fig. 14 and p. 17)?

Fig. 403. — Distribution of population in Asia

One dot represents 100,000 people.

In spite of this early progress, the Asiatic people have long stood still, while Europeans have been making rapid advances. In invention, exploration, and world commerce, the Asiatics took almost no part for many centuries. They seemed quite satisfied with their condition.

In recent times, however, an awakening has begun. Some of the countries of Asia have already made astonishing progress, and others have begun to follow their example.

II. Southwestern Asia

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Afghanistan	Monarchy	245,000	12,000,000	Herat	121,000
Countries of Arabian Peninsula:					
Aden	British protectorate	9,000	55,000	Aden (British colony)	46,000
Nejd	Monarchy	370,000	2,300,000	Mecca	60,000
Oman	Monarchy	82,000	500,000	Maskat	20,000
Yemen	Monarchy	75,000	2,500,000	San'a	25,000
Remaining territory		464,000	1,645,000		
Iraq (Mesopotamia)	British mandate	143,300	2,849,000	Baghdad	170,000
Kerak (Trans-Jordan)	British protectorate	Unsettled	240,000		
Palestine	British mandate	9,000	757,000	Jerusalem	63,000
Persia	Limited monarchy	628,000	9,500,000	Teheran	350,000
Syria	French mandate	60,000	2,400,000	Damascus	170,000
Turkey in Asia	Republic	483,600	11,487,000	Smyrna	99,000

Questions. — 1. How many of these countries have greater areas than our largest state? 2. How many of them exceed your own state in population? 3. Would you expect the populations in this table to be based upon accurate count or estimates, or to be rough estimates? Why?

Natural disadvantages of this area. — Southwestern Asia suffers from very great natural disadvantages. Much of the surface is so mountainous that agriculture is difficult. Point out mountainous sections on Fig. 406. A far greater handicap is the lack of rain; for Fig. 401 shows that nearly all the region south of the Black and Caspian seas and west of India is either true desert or semi-arid. In Fig. 402 locate the small area in which broad-leaved forests occur. A large part of this region lies within the belt of northeast trade winds; since these winds blow from over wide areas of land and into warmer regions, they are for the most part drying winds. What rivers of any probable importance for navigation do you find here?

Its extent and former prominence. — The great extent of this part of Asia, which includes Asia Minor, the vast peninsula of Arabia, and lands between them and eastward from them, is likely to be overlooked unless one notes the scale of the map. Estimate the distance from Constantinople to the southeastern boundary of Persia; from Constantinople to Jerusalem, and from there to Aden. On p. 388 note the area of Arabia; of Persia; of Iraq, or Mesopotamia. All together this arid region is nearly as large as the United States.

Southwestern Asia in very ancient times was one of the most important parts of the world. Several great nations developed here. The Babylonians, Chaldeans, and Assyrians flourished in the valley of the Tigris and Euphrates rivers. Huge mounds along these rivers still mark the sites of great cities of old, which contained magnificent palaces, temples, and libraries.

Three of the great religions of the world

© Underwood and Underwood

Fig. 404. — Reeling silk by hand in Syria

originated within this area; the Jewish, the Christian, and the Mohammedan. All three of these are closely associated with Jerusalem. One of them is associated with Mecca and Medina in that part of Nejd formerly called Hejaz. Locate these three cities.

Why it has lost its importance. — Why has this region lost its importance? There are two explanations that we can consider here. One is the damage resulting from war. In former times the lust for power was even more general than at present, and efforts at conquest were continually being made by ambitious rulers. This area, moreover, became

© Publishers' Photo Service

Fig. 405. — Jerusalem

Jerusalem has crooked, narrow streets, very old and badly paved. The two large domes shown in the background of the picture are the roofs of Turkish mosques. The city lies in the midst of a barren, dry region, and for that reason there is little trade there, except that of supplying the wants of tourists and the making of souvenirs.

the connecting link or bridge between Europe and the more populous parts of Asia and Africa, and therefore formed a part of the route traveled by peoples marching in either direction. Thus one nation after another in this region has been completely wiped out or enslaved; and destructive warfare has been continued more or less constantly down to the present time.

The other explanation is found in the character of the government during the past several centuries. The largest country here before the war was the Turkish Empire, the ruler being called the *Sultan* and residing in Constantinople. (See p. 381.) The ruler at Teheran, the capital of Persia, is called the *Shah*. The ruler of Afghanistan is known as the *Ameer*, with the seat of government at Kabul. Locate these cities. These rulers have been despots, whose power varied more or less with their ability; but they have resembled one another in seldom using their power for the welfare of their

---

Questions on Fig. 406. — 1. On this map, dotted purple lines represent boundaries between provinces or between different dependencies of the same nation. Show that this is true by comparison with Fig. 400. 2. The highest and most abrupt slope in the world is shown on this map. Point it out and, by reference to Fig. 401, show its effect upon rainfall. 3. Again by comparison with Fig. 400, show whether roughness of surface or lack of rainfall is the greater reason for a lack of railroads in certain sections, such as Arabia.

SOUTHWESTERN ASIA
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 100 200 300 400 600 700
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
Below sea level
Canals
Railroads
Capitals of countries
Longitude East from Greenwich
EUROPE
ASIA
AFRICA
UNION OF SOVIET SOCIALIST REPUBLICS
RUSSIAN REPUBLICS
TURKEY
PERSIA
SYRIA
IRAQ
ARABIA
NEJD
ARABIAN DESERT
AFGHANISTAN
BALUCHISTAN
TURKMENISTAN
USBEKISTAN
KARA-KIRGISIA
KARA-KOLPAK
MONGOLIA
PLATEAU OF MONGOLIA
PLATEAU OF TIBET
CHINA
INDIA
BURMA
SIAM
INDO-CHINA
FRENCH INDO-CHINA
MALAY PENSULA
FEDERATED MALAY STATES
CEYLON
ANDAMAN ISLANDS
NICOBAR ISLANDS
LACCADIVE ISLANDS
ARABIAN SEA
BAY OF BENGAL
INDIAN OCEAN
Constantinople
Black Sea
Caspian Sea
Aral Sea
Lake Balkash
Persian Gulf
Gulf of Oman
Gulf of Aden
Red Sea
Mediterranean Sea
Gulf of Siam
Strait of Malakka
Tropic of Cancer
Baku
Tashkent
Samarkand
Merv
Herat
Kabul
Peshawar
Kashgar
Yarkand
Khiva
Bokhara
Teheran
Tabriz
Mosul
Baghdad
Basra
Ispahan
Shustar
Damascus
Beirut
Jerusalem
Aleppo
Medina
Mecca
Hodeida
Aden
Muscat
Karachi
Gwadar
Quetta
Khelat
Lahore
Amritsar
Delhi
Meerut
Agra
Jodhpur
Jaipur
Ahmadabad
Bombay
Poona
Surat
Baroda
Indore
Bhopal
Jabalpur
Nagpur
Amraoti
Allahabad
Lucknow
Benares
Patna
Bhagalpur
Calcutta
Chandarnagar
Berhampore
Hyderabad
Madras
Bangalore
Pondicherry
Karikal
Tuticorin
Madura
Colombo
Panjim
Mahe
Ballary
Kulja
Turfan
Hami
Soochow
Lanchow
Sianfu
Chungking
Chengtu
Yungning
Yunnan
Lassa
Gartok
Punaka
Katmandu
Darjeeling
Mandalay
Bhamo
Myitkyina
Maulmain
Rangoon
Bassein
Bangkok
Pakanbaru
Singapore
Georgetown
Penang
Amherst
Vinh
Haiphong
Hanoi
Yangtze R.
Yellow R.
Indus R.
Ganges R.
Brahmaputra R.
Irrawaddy R.
Salween R.
Mekong R.
Euphrates R.
Tigris R.
Nile R.
Suez Canal
Cairo
Alexandria
Port Said
Aden
Jidda
Riad
Hofuf
Koweit
Bahrein
Muscat
Maskat
Gwadar
Karachi
Quetta
Khelat
Peshawar
Khyber Pass
Bolan Pass
Kabul
Herat
Merv
Tashkent
Samarkand
Bokhara
Khiva
Baku
Batum
Trebizond
Erzerum
Erivan
Kars
Angora
Brusa
Smyrna
Adana
Aleppo
Damascus
Beirut
Jerusalem
Haifa
Jaffa
Gaza
Suez
Akaba
Medina
Mecca
Hodeida
Aden
Muscat
Karachi
Gwadar
Quetta
Khelat
Peshawar

subjects. In general they have done little to preserve order, have opposed progress of almost every kind, have cruelly oppressed the subject races found within their borders, and have collected as taxes almost everything produced except the bare necessaries of life.

Fig. 407. — Bedouins in a dry stream bed, Arabia

Bedouins, the best-known division of the Arab race, live a roving life as shepherds or herdsmen. The women are fond of glass-bead ornaments; and headdresses, such as you see on the women in the picture, are worn by all Bedouin women. Bedouin men usually carry lances.

How industry has been held back. — One sees the effects of these misfortunes on every hand, for these countries show few modern improvements. The wooden plow, consisting of little more than a sharpened stick, is very common; mallets are much used for breaking clods; the sickle is the implement for gathering the grain; and threshing is done on the smooth, hard earth of the house yard, where the chaff is separated from the grain with the help of the wind.

By keeping simple methods of farming

Under such circumstances the farm products cannot be extensive. The chief industry outside of the cities is grazing, since a large portion of the land cannot be irrigated and can grow only grass. Cattle are much less common than sheep. Can you suggest why? There are, however, oases and irrigated valleys, where wheat, barley, figs, olives, dates, and lemons are grown, and sometimes cotton and rice.

In some places other products are found. For example, in eastern Afghanistan, in the valley of the Kabul River, the traveler sees field after field of wheat broken by orchards of mulberry trees, walnuts, apricots, and other trees. But the farm products are meager, and most of the people are hungry and poorly clothed and sheltered.

Nor do mining and manufacturing provide much of a livelihood, for they are poorly developed. In large areas the mineral deposits have not yet been investigated; and in those where minerals have been discovered little mining has been done. There are very few factories as we know them; for while Persian, Afghan, and Turkish rugs are famous the world over, practically all such manufacturing is done by hand in homes or small shops. Single looms are in general use, on which perhaps only three or four rugs are produced in an entire year. Not infrequently two years or more are required to make one rug. One reason for the development of this industry is the abundance of wool; for sheep, as we have seen, are numerous in these countries.

By neglect of mining and manufacturing

A great barrier to all industry is the lack of means of transportation and communication. The vast country of Persia has about four hundred miles of railroad, and Fig. 400, in which all the railroads are shown, indicates how few there are throughout this part of Asia. Which country seems best supplied? Highways are no better developed. The roads are only donkey or camel paths. Travelers and mail must be carried in rude carts, while merchandise is transported by pack animals. There seems to be some prospect, however, of considerable improvement in this respect. English companies have put airplanes into operation from the capitals of western Europe to Baghdad. Explain how such lines will probably help trade.

By lack of transportation and communication

© Mirzaoff

Fig. 408. — A caravansary in Syria

Donkeys and camels are here at rest in the inner court of a desert inn. In this inclosure men, animals, and goods are protected from robbers, who frequent the desert routes.

Why three European nations have been especially interested in this region. — Notwithstanding all these facts concerning the undeveloped condition of southwestern Asia, the British, Germans, and Russians have been greatly interested in this region. How can this be explained?

India, Australia, vast territory in eastern Africa, and many islands in the Indian and Pacific oceans belong to the British Empire. The British can best reach these colonies by way of the Mediterranean Sea, the Suez Canal, and the Red Sea. This route is shorter by 5,000 miles than the one around Africa. Accordingly, ever since 1875, when the British obtained control of the Suez Canal, they have guarded this waterway with great care. Their possession of Gibraltar (p. 360) gave them control of the western entrance to the Mediterranean; and their possession of Aden, at the southwestern point of Arabia, secured similar control of the entrance to the Red Sea. Indeed Aden is often called the Gibraltar of the East. Trace the route past these two points.

Reasons for British interest

The value of this waterway, both for commerce and for war, has led to a lively interest on the part of the British in the countries bordering it, particularly in those near the Suez Canal. It has also led them to oppose the establishment of any rival route.

The Germans conceived a plan for another shorter route to the Far East. This was the

project of continuing the Berlin-to-Constantinople railway (p. 380) from the latter city across Asia Minor, through Aleppo and Mosul, to Baghdad and thence to the Persian Gulf. (See Fig. 406.) Estimate how much shorter this would be than the British route. Since it was to be a rail route, also, it would be a far quicker means of travel and transportation between western Europe and the Orient than the waterway. It would, therefore, have greatly reduced the importance of the latter; and since the Turks, through whose territory it was to run, were German allies, its chief advantages would have fallen to the Germans. What advantages for warfare or commerce might it have secured for them? How much of this railway had been completed before the war, as shown in Fig. 406?

Reasons for German and Russian interest

© *Publishers' Photo Service*

Fig. 409. — Ocean steamers passing in the Suez Canal

Locate the Suez Canal. About how long is it? What ocean routes pass through it (Fig. 406)? Is it as important as the Panama Canal in the number of routes that use it? Note in the picture the barren region through which the canal is dug.

Losses of the Turkish Empire in Asia as a result of the World War. — After the Turks and the Germans were defeated, the British accepted one of the most important districts, Iraq, or Mesopotamia, under a *mandate* from the League of Nations (p. 381). This means that they assumed the task of establishing order and developing the country, with responsibility to the League for the character of their government.

The loss of Mesopotamia to the British

Mesopotamia is a region of about 150,000 square miles, but its boundaries are still undetermined. The name was applied by the ancients to the land *between the rivers* (the Tigris and the Euphrates), but it has been extended to apply to the plains southward from the mountains to the Persian Gulf. It is four fifths as large as Germany, but has one twenty-fifth the population. Being nearly surrounded by mountains, it receives little rain. At Baghdad the rainfall is only 6.6 inches per year and farther south it is even less. Strange to say, much of the land that is not desert is swamp; for the mountains in the northwest regularly pour forth their floods into the two great rivers, and as most of the irrigation canals of the ancients are in ruins, much of this water has no outlet. On that account the swamps even in so arid a region are very extensive.

Yet there are great possibilities here. In ancient times this plain possibly supplied as many as 10,000,000 to 20,000,000 inhabitants with food. Baghdad is still a large city

in the midst of luxuriant orchards of fig trees, olives, dates, and pomegranates. Its importance is due chiefly to its location at the crossing of many routes of travel. Large steamers from the Persian Gulf can reach it, as well as smaller boats from the northwest. Many caravan routes run from the Persian Gulf to the eastern part of Turkey, formerly called Armenia, and from Persia to the Mediterranean. It is, also, on one of the great pilgrim routes for Moslems from central Asia to Mecca. Mosul is an important city standing near the site of the ancient city of Nineveh on the Tigris River; and Basra is the leading town near the mouth. Locate these routes and cities. Near Mosul are large deposits of petroleum.

There is an abundance of water in the Euphrates and Tigris rivers for irrigation. If such work is carried on according to a scientific plan and order is established among the inhabitants, this country may gradually be restored to its former greatness.

Losses in the Arabian Peninsula

Another section that has been separated from the Turkish Empire has taken away two of its most noted cities. This section of Arabia, formerly the kingdom of Hejaz, in 1925 was annexed to the neighboring sultanate of Nejd. Its two chief cities, Mecca and Medina, are sacred to all Mohammedans. The former is the birthplace of Mohammed and a spot that every one of his followers hopes at some time in his life to visit. As there are probably not less than 220,000,000 Mohammedans in the world, the principal occupation of the city is the entertainment of pilgrims. Although it has only 60,000 inhabitants, it frequently shelters as many as 100,000 strangers at one time. Medina is almost equally venerated, being the place to which Mohammed once fled when the citizens of Mecca threatened his life, and also the place where he was buried.

In Fig. 406 note that both these cities are situated inland, with their ports on the low coast land. Where else have you found such cities thus arranged in pairs? What does this arrangement suggest to you about the character of the country and of the climate?

© *Underwood and Underwood*

Fig. 410. — The harbor of Beirut, Syria

In the background are the Lebanon Mountains, on which once grew great forests of cedar. This is a prosperous city for Syria, because a railroad extends eastward to the Aleppo-Mecca railroad.

The loss by transfer of Syria

A third part of the former Turkish Empire, Syria, became mandated territory of the French. The importance of Syria lies partly in the fact that it is on the route by land between Egypt and Europe, and also between Egypt and the Orient. Can you explain why caravans bound from Egypt to Persia and India do not go directly eastward? If you cannot, Fig. 406 may give you some help. Follow the railroad that extends from Medina northward

and note the branch lines connecting it with ports on the Mediterranean. These railroads are a recent improvement. What changes do you imagine they have brought about in the country through which they pass? Aleppo and Damascus are by far the largest cities on this railroad. The climate and products of Syria are similar to those of Mesopotamia. Name several of the products. As in southern Europe, the rains come principally in winter, so that irrigation is usually necessary for agriculture.

© Mirzaoff

Fig. 411. — A Bedouin encampment in Arabia

Another district that was under Turkish rule for centuries is Palestine and Kerak (Trans-Jordan). This region is called the Holy Land because it was the birthplace of Christianity. Jerusalem is a sacred city to Jews, Christians, and Mohammedans, having been the capital of the Jewish nation, the scene of Christ's teaching, and the place from which Mohammed is believed by his followers to have ascended to heaven. The possible value of this region is suggested by the attempt now being made by Jewish organizations to establish there a national home for the Jewish people, who have at times suffered considerable persecution in Europe and in Asia.

The loss of Palestine and Kerak

Fig. 406 shows how mountainous the surface is. Describe what you see there. The arid climate combined with the rough surface seems to make the region much better suited to the grazing of sheep and goats than to intensive farming. More than that, no coal is found there, nor iron, copper, zinc, or lead; neither is there much water power or extensive forests. What industry could thrive, therefore, beside agriculture?

Turkey since the World War. — For many years the Christian inhabitants of Turkish Armenia, a large district in the eastern part of Asia Minor, had suffered cruel persecutions at the hands of the Mohammedan Turks. After the World War it was hoped that Turkish Armenia would win its independence or at least be taken over under a mandate by a strong nation. In fact, the United States was at one time asked to assume this responsibility. Another district that hoped to free itself from Turkish rule was Smyrna, in western Asia Minor, a city having a population of 375,000 until recently and ranking next to Constantinople in size and importance among the cities of this region. But these hopes proved short-lived, for three reasons. In the first place, a more progressive element had gained control of Turkey, improved its government, and strengthened its military power. In the second place, the Allies were unable to agree upon active measures of opposition to the Turks. In the third place, though Smyrna was assigned to Greece soon

after the war, Greece waged a disastrous offensive war against the Turks in 1922, with the result that she was completely expelled from Asia Minor.

Facts to be especially well fixed. — 1. The location of Jerusalem; Mecca; Medina; Damascus; Aleppo; Baghdad; Teheran; Kabul; Angora. 2. The names and locations of the countries in southwestern Asia. 3. The names and locations of the two largest rivers. 4. The rainfall of this area. 5. Its principal products. 6. Recent changes in the political status of Turkey.

Problems for independent study. — 1. Write a composition on the history and importance of the Suez Canal. Huntington, E.: *Asia*, p. 44 (Rand McNally); Herbertson, F. D.: *Asia, Oxford Geographies*, vol. 4, pp. 6–8 (Oxford University Press); Chamberlain, J. F., and Chamberlain, A. H.: *Africa*, rev. ed., pp. 188–194 (Macmillan). 2. Discuss the possibility that the valley of the Euphrates and Tigris rivers may surpass that of the Nile in importance. See pp. 453–455; also Huntington, E.: *Asia*, pp. 28, 70–85; Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 244–250 (Ginn); Herbertson, A. J.: *Asia*, pp. 77–79 (Macmillan); Dakin, W. S.: *Great Rivers of the World* (Macmillan). 3. Do you think that the British are likely to attempt to hold Mesopotamia permanently? Why? Huntington, E.: *Asia*, pp. 70–72; National Geographic Magazine, vol. 38, p. 81. 4. Tell some of the stories of the "Arabian Nights," whose scene is at Baghdad. Read *Arabian Nights' Entertainments*, Clifton Johnson (Macmillan). 5. See what the Bible says about Nineveh. 6. Read about the persecutions of the Armenians. Huntington, E.: *Asia*, pp. 84–89; National Geographic Magazine, vol. 36, pp. 393–420. 7. What arguments can you suggest for and against the advisability of repeopling the Holy Land with Jews? Look up "Zionism" in the leading magazines (see p. 94). 8. Find in a history of the world or of ancient times maps of the empires that have spread over southwestern Asia.

III. Central and Northern Asia

Recent political changes. — The central and northern parts of Asia together form Asiatic Russia. The southwestern part of Asiatic Russia has long been divided into several semi-independent nations. Both their names and their boundaries, however, have been greatly changed since the Russian revolution; in fact, these new political divisions were not entirely definite in 1926. For this reason their names do not appear at the

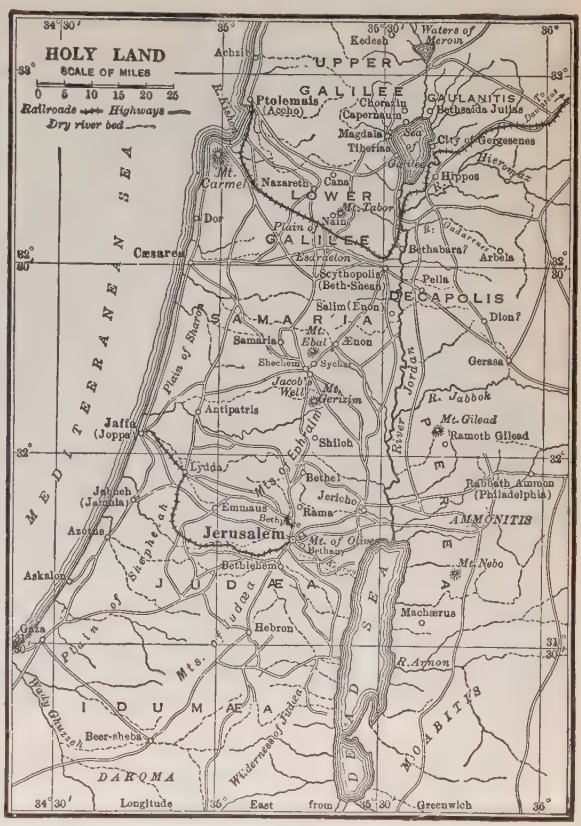


Fig. 412

With what names on this map are you already familiar?

head of this section in such a table as is usual elsewhere in this book. They are listed, however, in the Appendix as they were known in 1926. Siberia, which is the name generally given to the northern and eastern parts of Asiatic Russia, is no longer a single country; it now consists of several subdivisions of the Russian Soviet Republic, or that part of the

Russian Union which is governed directly from Moscow. These subdivisions have been determined largely by racial grouping and have a large measure of self-government.

How west central Asia resembles Persia and Mesopotamia. — Between the Caspian Sea and China is an area nearly one half as large as the United States that closely resembles Persia and Mesopotamia in climate and occupations. The rainfall is even less than in those two countries. The Aral Sea, near the center, is salt, like Great Salt Lake; Fig. 403 shows a very thin population west and south of it. Is the population greater or smaller to the east and the north? Name the political divisions that you find here.

Grazing is one of the leading occupations in all this region. This explains why many of the inhabitants lead a nomadic life. Can you show how? The many oases partly explain the presence of cities, the largest of which is Tashkent. Locate it and the other important ones. Bokhara and Khiva are cities in districts from which many rugs are imported into this country. Why are they noted for rugs? If the rainfall were increased by ten inches, probably the manufacture of rugs would be less prominent. Can you see why? What other changes might then be expected?

© *Publishers' Photo Service*

Fig. 413. — A family in their home in Bokhara, central Asia

Nearly twenty per cent of the natives of Bokhara are nomads and about fifteen per cent live a partially roving life. Their chief industry is the raising of sheep and horses, although farming is carried on in some of the valleys of the interior.

Railroads are usually very few in such arid lands; and you may already have asked yourself why two should have been built here. State the courses that they take. One reason for their existence is that caravan routes have for centuries led across this region from China and India to Europe, and railroads are now beginning to take their place.

The extensive trade along these routes is the chief reason for the large cities mentioned above. The agricultural products are similar to those of Mesopotamia. Name several of them. Cotton should be added to the list, for the Russians have been trying to produce cotton here, in order that they may not have to import so much from the United States. At present these countries rank as more or less independent members of the federation of which European Russia is actually at the head.

Asiatic Russia compared with Canada. — Asiatic Russia, formerly called *Siberia*, has an enormous area, like Canada. In fact, it is considerably larger than Canada and has a somewhat larger population. Compare their areas and numbers of inhabitants.

Asiatic Russia, like northern Canada, consists of frozen plains, or tundras, that are too cold for any vegetation except mosses and other tiny plants. The most severe climate of the world is found there. How cold it is in winter is indicated by the fact that the ice in the ponds and rivers even in the southern part of the country freezes to a depth of ten feet. For many weeks in the winter the temperature remains below the freezing point of mercury, which is 40° below zero.

Likeness in climate and products of the soil

Fig. 14 recalls the extent of forest lands in Canada. There are similar forests south of the tundras in Russia, which are still more extensive. Note in Fig. 402 that these reach all the way from the Ural Mountains to the Okhotsk and Bering seas, 5,000 miles away. Estimate the distance across these forests in a north and south direction. Throughout these forests are many kinds of valuable timber and fur-bearing animals. The sable, ermine, fox, and bear are numerous; and, because of the unusually low winter temperatures, their furs are especially warm. As in Canada, therefore, furs have long been among the most important exports.

South of about the 60th parallel of latitude agriculture is possible. The best developed farming region is south of Tobolsk and in the neighborhood of Tomsk. Locate this town (Fig. 400). This section has fertile, black soil, being a continuation of the black loam belt of European Russia (p. 350). While the rainfall is not heavy, many varieties of grain can be grown. Wheat, as in Canada, is the most important. Dairying, particularly the manufacture of butter, has also become extensive, for the nutritious grasses and cool climate favor that industry. More than one half of the inhabitants of Asiatic Russia live in this vicinity.

This region is also like Canada in having great stores of minerals. Coal is widely distributed, being found in the foothills of the Altai Mountains, in the neighborhood of Irkutsk, near the Pacific coast, and on the island of Sakhalin. Locate these regions. There is iron ore in many places, as well as large deposits of gold, copper, lead, and graphite.

Likeness in mineral resources

©Publishers' Photo Service

Fig. 414. — Station on the Trans-Siberian railway

Finally, as in Canada, the recent construction of railways has given a great impetus to the development of the country. Note that one road runs from Leningrad through Moscow all the way to the Pacific coast. Estimate its length. Locate Vladivostok and Port Arthur, the two termini of this road on the Pacific (Fig. 427). Does this resemble the

Likeness in railway development

Canadian roads in having to cross an extensive mountainous section? What can you say about the number of railways here as compared with the number in Canada? The Trans-Siberian railway traverses the most productive portion of this region. Little land farther than 200 miles from it on either side can ever be very valuable for agriculture. Probably this long, narrow strip of land will attract a great population in the near future. Can you suggest reasons why this likely?

© *Publishers' Photo Service*

Fig. 415. — A village in Siberia

Many Siberian villages were first settled by exiles from Russia before the revolution of 1917, and by large numbers of Russians who went there to escape the hardships of Russian peasant life. Many of these settlements are on the *steppes*, where there is little rain and the soil is too poor for farming, so that fishing and hunting form the chief industries. Transportation is carried on mainly by horses. Notice the peculiar yoke into which the horses are harnessed.

Still Asiatic Russia can hardly be expected to progress as fast as Canada. Let us see why. In the first place, it has no waterway at all equal to the Great Lakes and the St. Lawrence River for transportation of goods. Three of its great rivers lead toward the Arctic Ocean, which is not a direction favorable to commerce. Why? Name and locate these rivers.

Why its development will hardly equal that of Canada

Asiatic Russia lacks the advantage that Canada enjoys in having a great industrial nation immediately south of it to supply a market for its agricultural products and furnish it with large quantities of manufactured goods. What countries do you find along its southern boundary? What does Fig. 403 tell you about their population?

Does it seem to you an advantage or a disadvantage that this region has the bleak plains of European Russia west of it, whereas Canada has the Pacific Ocean with its warm, damp winds?

Perhaps the greatest disadvantage of this great area is that its inhabitants are less progressive than those of Canada. Their methods of farming, for example, are very primitive, and the yield of wheat averages but ten bushels per acre while that of Canada is more than twice that amount.

Facts to be especially well fixed. — 1. The course of the Trans-Siberian railway from Leningrad to Vladivostok and Port Arthur. 2. Names and locations of the four great rivers of northern Asia. 3. Location of Bokhara; Khiva; Aral Sea; Tashkent; Irkutsk; Lake Baikal; Tomsk.

Problems for independent study. — 1. The region east of the Lena River near the Arctic circle is one of the *cold poles* of the northern hemisphere. What is the meaning of that term, and why should that pole be at this place? Huntington, E.: *Asia*, p. 145 (Rand McNally). 2. Can you suggest other disadvantages that Asiatic Russia suffers in comparison with Canada? Carpenter, F. G.: *Asia*, pp. 13-16, 452–462 (American Book); Huntington, E.: *Asia*, pp. 137–151. 3. In view of what you have learned of the government of Russia, does it seem likely that the present governments of northern Asia will be permanent? 4. Compare wheat-growing in Canada and in Asiatic Russia as to area, climate and soil, methods, production, and markets. Bengtson and Griffith: *The Wheat Industry*, pp. 269–285, 289–291 (Macmillan).

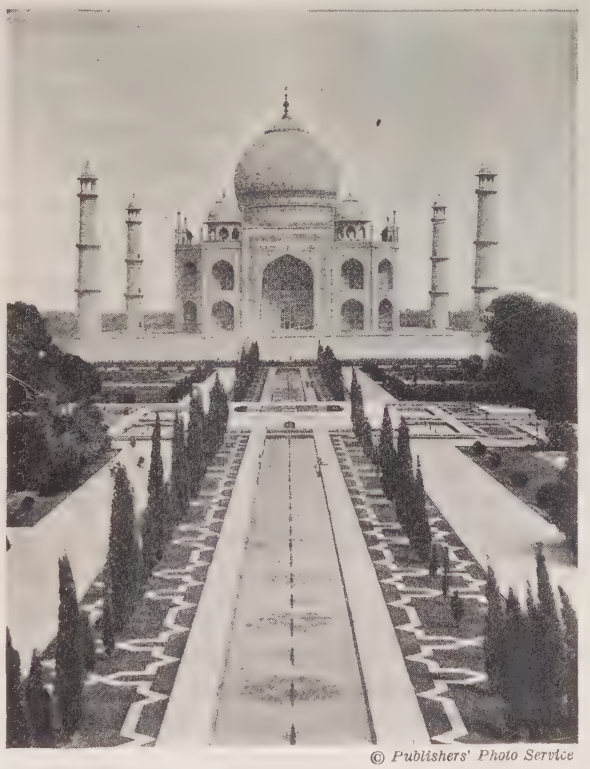
IV. India and Ceylon

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Indian Empire:	British colony	1,805,300	318,942,000	Calcutta	1,328,000
Indian Peninsula		1,408,000	304,930,000	Calcutta	1,328,000
Baluchistan		134,600	800,000	Quetta	49,000
Burma		262,700	13,212,000	Rangoon	342,000
Bhutan	Monarchy	20,000	250,000	Punakha	5,000
Nepal	Monarchy	54,000	5,600,000	Katmandu	80,000
Ceylon	British colony	25,300	4,505,000	Colombo	244,000

Importance of India. — The princes of India have long been famous for the magnificence of the trappings of their horses and elephants, for the splendor of their own clothing and ornaments, and for the grandeur of their palaces. Throughout the Middle Ages, India and Ceylon furnished a large part of the luxuries that the wealthy people of Europe obtained from the Orient. India was in advance of Europe in the production of textiles; and its muslins, silks, satins, taffetas, and damasks were in great demand in the West. Its metal work in the form of gold and silver chains, bracelets, rings, and other ornaments was especially fine. Its precious stones, including diamonds, pearls, garnets, rubies, sapphires, and amethysts, were hardly equaled elsewhere. Spices, also, such as cinnamon, pepper, cloves, nutmeg, ginger, and allspice, were exported in large quantities.

Why it had a large trade with Europe centuries ago

All these goods were so much desired by the people of Europe that numerous caravans, with scores of camels and horses, each year crossed the deserts of southwestern Asia in this trade with India. Indeed, the demand for them was so great that it was one of the causes of the discovery of America; for, when the Turks conquered the lands east of the Mediterranean and disturbed the caravan routes between India and Europe, explorers were stimulated to find some other route for this commerce.



© *Publishers' Photo Service*

Fig. 416. — The Taj Mahal at Agra, India

This tomb, erected by a native Indian prince in memory of his wife, is considered the most beautiful building in India. Its white marble exterior is delicately carved, and its interior is of alabaster studded with precious jewels. It is surrounded by a garden, as are most of the Moslem tombs.

Having about one half the area of the United States and containing three times as many in-

habitants, India is a country of enormous importance. Though no longer a land of fabulous riches, it still has many valuable products for export; and its great population makes it a possible market for a vast quantity of foreign goods. It is certain that the Germans had India in mind when they planned the Berlin-to-Baghdad railway; and just as certainly Russia has envied the British their possession of so valuable a territory.

Why it is now of great importance

© *Publishers' Photo Service*

Fig. 417. — Shawl makers in Kashmir, India

Kashmir is the center of the woolen industry in India. The demand for woolen fabrics, except for the uniforms of the army and the police, is very small in comparison with that for cotton. Can you suggest why? Kashmir weavers are expert carpet makers. Silk weaving, however, is rapidly becoming the leading textile industry of this region.

Extent of mining and manufacturing. — With so great a start over Europe in manufacturing in the Middle Ages, India might have been expected to lead in many types of industry to-day; but this is far from the truth.

India has extensive deposits of coal, iron ore, lead, copper, and petroleum, but mining is not well developed. The output of coal is more valuable than that of any other mineral; but the quantity mined is not very large.

Hand manufacturing is still extensive, including many other products than those already mentioned. For example, the handmade Kashmir shawls and carpets are noted for their fine quality, and a large part of the preparation of the grains for food is done by hand. Hand looms are very common for all sorts of weaving. At the same time there are many mills for spinning and weaving, as well as paper mills, machine and repair shops, sawmills, and tile and brick factories. While the number of mills and factories is increasing, it is still extremely small in proportion to the population as compared with the number in western Europe.

Why these industries have made such slow progress. — Why have mining and manufacturing advanced so slowly? Probably the leading reason is the religion of the mass of the population. About three fourths of them are Brahmans. This religion divides the people into classes, called *castes*. According to this creed no person can rise above the caste in which he was born; and many belong to so lowly an order that they are considered outcasts from society and unworthy of attention or care from those of higher rank. Under the influence of such a religion there is no ambition to better one's condition, and education for the masses of the people is entirely discouraged. Thus partly on account of religion not more than one person in sixteen in India can read, and ignorance and superstition are widespread. People so ignorant can hardly handle ma-

Influence of religion on industries

chinery with skill; consequently they are limited to handwork, at a very low wage.

Poor use of capital

The way in which the wealthy inhabitants hoard their riches is a further explanation of the slow development of industry. In Western countries money is expected to earn more money by being invested in mines, railroads, and factories. By such use of it these undertakings are advanced in a way that benefits other people, while those who own the capital are also enriched. In India, however, the custom has been rather to build palaces, purchase jewels or elephants for ceremonial displays, or to melt gold and silver into bars and hide such treasures in secret places. The poor imitate the rich in this habit of withdrawing their savings from trade channels, and the wealth of India to-day is partly the result of thousands of years of such hoarding. What do you think of this habit? Can you show that the country would probably be far wealthier if the methods of the Western nations had been followed?

For such reasons as these there is only one great occupation in India — agriculture, upon which about three fourths of all the inhabitants depend for a living. What danger do you see in thus relying chiefly upon one industry, especially when the population is so large?

How so great a population attempts to make a living through agriculture. — If you examine Fig. 495 you will find that India extends from a point as far south as the mouth of the Orinoco River in South America to one about as far north as St. Louis. How many degrees of latitude does that include? Compare this with the width of the United States.

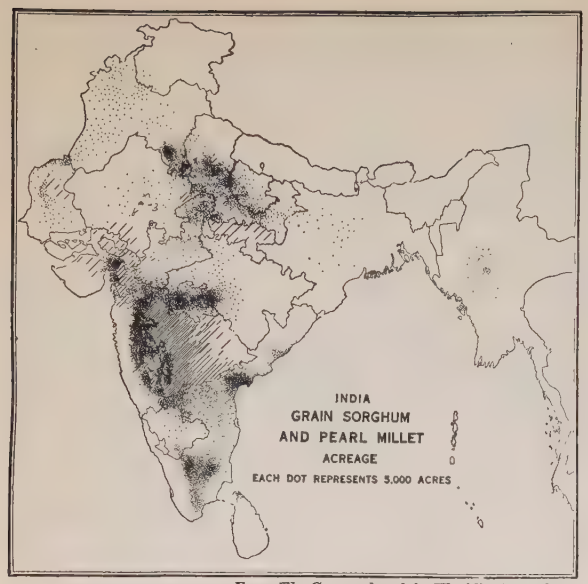
This great range of latitude would assure a wide variety of temperature and therefore of farm products, even if the country were all lowland. But the surface varies greatly in elevation, which considerably increases the variation of temperature. In what temperature regions is India?

Conditions that favor a great variety of farm products

There are three extensive areas of different elevations. (1) Most of the peninsula is a plateau, averaging about 2,000 feet in height. (2) North of this plateau is a broad lowland occupied by the Brahmaputra, Ganges, and Indus rivers, which, like the Po River of Italy, have built up the plains out of sediment brought from the mountains. (3) To the north of the river plains are lofty mountains, the highest being the Himalayas. In these mountains are scores of peaks that reach an altitude of over four miles. Even the mountain passes are from 17,000 to 19,000 feet above sea level, or much higher than Mont Blanc in the Alps.

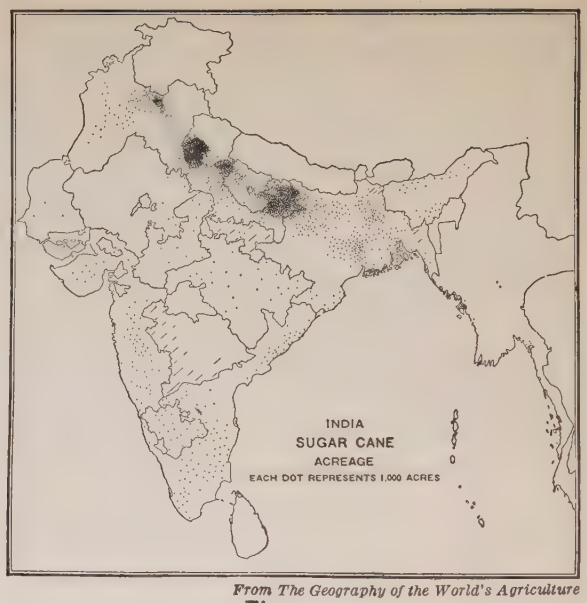
The leading farm products in comparison with those of the United States

With such location and surface features, India can raise almost any tropical or subtropical plant, in addition to most of the crops that are produced in the United States. Wheat is extensively grown. Most of it is found in the northwestern part of the country, where the rainfall is too little and the changes of temperature are too great for many other crops. In Fig. 421 it is plain that rice is grown chiefly in the northeastern section. What river basin produces the greatest amount? A third very important food, as shown in Fig. 418, is millet, one of the first grains to be cultivated by the human race. Some corn is grown, but not a large amount. India in most years produces more cane sugar than Cuba (p. 202), thus leading the world in this product. Fig. 419 shows where this is grown. Note



From The Geography of the World's Agriculture

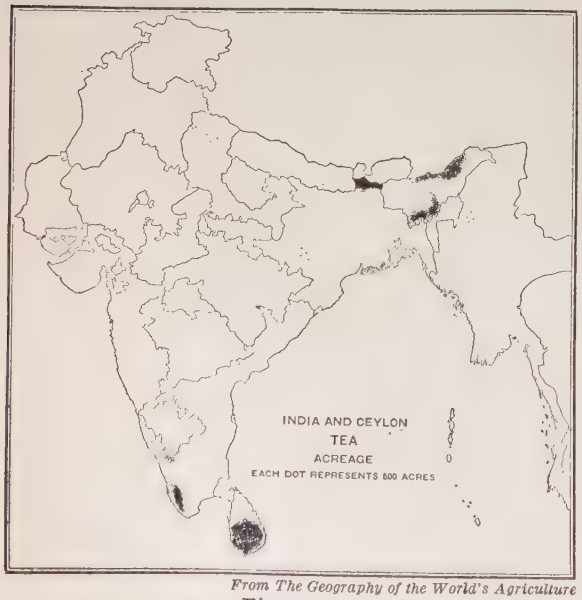
Fig. 418



From The Geography of the World's Agriculture

Fig. 419

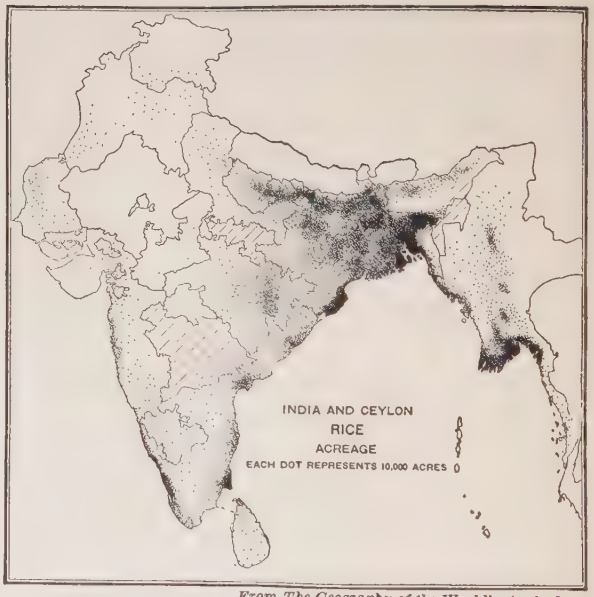
The millet grown and eaten in India exceeds in amount the wheat but not the rice. It is a staple crop, for it grows for the most part on land that is not irrigated, and requires less moisture than does rice. Sorghum is the staple grain crop of southern India. About 3,000,000 acres of land are devoted to the growing of sugar cane. For the comparative importance of India as a sugar-producing region, see also Fig. 489.



From The Geography of the World's Agriculture

Fig. 420

Tea is grown in only a few sections of India. In Ceylon the English owners and managers of the tea plantations are using improved methods and machinery in tea culture. The tea regions of India and Ceylon are well supplied with moisture and have warm temperatures all the year.



From The Geography of the World's Agriculture

Fig. 421

Rice is most abundant in Burma, Bengal, and Madras, because the rainfall is heaviest in these provinces. Nearly 40,000,000 acres are devoted to rice growing in Bengal. Much of the Indian rice is exported to Europe.

the importance of the Ganges Basin in this respect; it is the most productive and most thickly populated part of India.

Fig. 420 shows the distribution of a crop that our scarcity of cheap labor does not permit, namely, tea. Note the prominence of the island of Ceylon in this product. What correspondence do you find between the tea areas and the rainfall as shown in Fig. 401?

Much cotton is grown in the central part of India. Some of this is sent to factories at home, but a large amount of raw cotton is exported for use in the cotton mills of Great Britain. The importance of Indian cotton, however, is not as great as one would expect from the amount produced; for it is greatly inferior to that grown in the United States. Other important agricultural products are jute, used in making coarse bags, tobacco, and opium, a drug obtained from a species of poppy. Some crops which are raised most extensively in the United States are of little or no importance in India. Can you give examples?

How do the methods of agriculture differ from our own? Remembering the ignorance of the mass of the people, we might expect old-fashioned methods to be employed. Yet it is plain that with a population three times as large as ours to be supported chiefly by agriculture on an area one half as great, they must work intelligently to avoid starvation. They understand the value of crop rotation, and of adaptation of crops to soil and climate. Their farms are small, however, ranging from one to eight acres, and there is little use of machinery. They likewise make less use of animal power than we do. Cattle, of a humped variety, are their principal work animals. For religious reasons, they do not eat the flesh of their cattle, nor do they drink their milk to any great extent; cattle are thus valuable almost solely as draft animals and beasts of burden. Milk is obtained chiefly from the water buffalo, which serves, also, as a draft animal in wet and flooded fields.

How their farming methods differ from our own

© *Publishers' Photo Service*

Fig. 422. — Oxcarts hauling cotton, India

Humped cattle such as those in the picture haul most of the freight in India, pull its plows, and even draw its carriages. A certain breed in Bombay is well adapted to the drawing of heavy loads over the sandy soil. Cattle are considered sacred by the inhabitants of India, and their flesh is not eaten. Try to account for the number of cattle indicated in Fig. 493.

Perhaps the most striking difference between agriculture in India and that in the United States is its extreme dependence upon favorable winds. Review what you have already learned about the winds and rainfall of India (p. 239). What is meant by the term *monsoon?* The southwest or wet monsoon brings heavy rains beginning in June. The summer crops are mainly

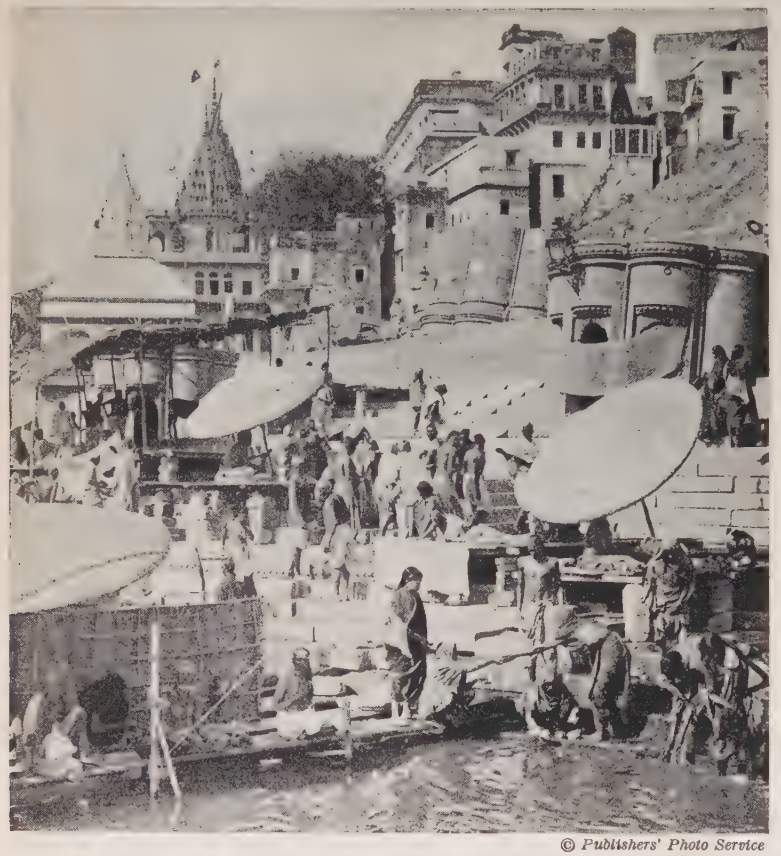
sugar cane, cotton, and other crops that require considerable moisture and warmth.

The northeast or dry monsoon brings rain to only a few east-facing slopes. Can you see why, by examining Fig. 427? During that season the winter crops are raised, consisting largely of wheat and other grains. Thus two crops a year are raised over most of India, the cultivation of which is very dependent on these two winds.

Frequently some of the crops are a failure, and thousands or even millions of deaths from hunger may follow. There have been over twenty disastrous famines in India during the last 150 years.

The very irregular distribution of rainfall through the twelve months and in different sections of the country means that only a small proportion of the total amount can be used for agriculture. The heaviest fall in the world occurs in the Himalayas near the delta of the Ganges River, where it averages 500 to 600 inches, and frequently causes destructive floods (Fig. 401). But in many other sections there is barely enough for agriculture; and then, when the amount happens to be a little less than usual, suffering may result.

Why India has been a land of many famines



© *Publishers' Photo Service*

Fig. 423.— Religious devotees bathing in the Ganges at Benares, India

Benares, one of the oldest cities in the world, is the holy city of the Hindus. It is situated along the Ganges River, the bank of which is entirely lined with stone terraces for the convenience of the throngs of bathers and worshippers who come, some traveling hundreds of miles, to wash away their sins in the sacred river.

A more general danger is threatened when the southwest monsoon is irregular. A delay of two or three weeks hinders the growing season just so much, and when the season is held up until August, which sometimes happens, there is almost a complete failure of crops. Or it may cease too early and lead to the same result.

Until there was a considerable mileage of railroads, there was often great suffering for want of food in regions where the rains failed. Do you see how railroads have been a help in famine relief?

One way to escape danger from drought is to store up all water possible with the object of using it later as needed. That is a common practice in India, which has far

more irrigated land than we have. The largest irrigated tract is in the western part of the Ganges Basin. Since that river rises in the lofty Himalayas, it is always sure of a good supply of water. Water from wells is likewise used for irrigation. There are thousands of irrigation wells in India. The surface of the Dekkan, the interior plateau, is so irregular that large irrigation projects are impossible there. Wells, however, and small storage basins that water only a few acres are very numerous.

Ways of preventing famine

How the British came into possession of the Indian Empire. — How do the English happen to be in control of this region? Over 300 years ago a company of London merchants gained a foothold in India for trading purposes. At that time the peninsula was divided among many hundreds of native rulers. At the present time there are about 700 such rulers, whose territory varies in size from a few villages to nearly 100,000 square miles. There are a great many languages, also; at least twenty are spoken by more than 1,000,000 persons each. Among such a mixture of peoples the British were often called upon to settle disputes. Partly in this way, and partly in protecting British subjects engaged in the Indian trade, Great Britain gradually increased its control of the peninsula.

The Indian Empire now includes not only the provinces of the Indian peninsula, but also Burma on the east, whose chief city is Rangoon, at the mouth of the Irrawaddy River. The Empire also includes Baluchistan on the west.

The capital of the empire is Delhi, a city of about a quarter of a million inhabitants. State several advantages that you see in its location for that purpose (Fig. 406). Does Calcutta, the former capital, or Bombay or Madras offer a better or worse location? State the reason for your answer.

© *Brown and Dawson*

Fig. 424. — The entrance of the Jumna Musjid Mosque, Delhi

This mosque, whose twin turrets are seen in the background, is one of the most noted buildings in Delhi. Its walls at one time were covered with thin sheets of gold, and one of its halls contained the Peacock Throne, adorned with hundreds of sapphires, rubies, pearls, and other precious stones.

Progress of India under British control. — What progress has India made under the British? First of all, the number of disputes and wars among the native rulers has been greatly reduced and order has been established. Protection has also been furnished from invasion of the country from the northwest. Realizing the pressing need of education, the government has established many native schools and several universities, and Indian students have been encouraged to attend foreign universities. The caste system has

Better order and protection for the inhabitants

also been partly broken down, with resulting benefits to millions of people.

Sanitary measures have been extensively introduced, for India has suffered greatly from tropical diseases and plagues. Hospitals are maintained by the government in all the large cities, pure drinking water has been supplied, and medical treatment is provided for the poor.

© *Publishers' Photo Service*

Fig. 425. — The railway station at Bombay

Bombay is the chief railway center of western India. Victoria Station, at the western end of the Great Indian Peninsular Railway, is one of the most notable buildings in the city.

The principal industry, agriculture, has likewise been improved, especially in the increase in irrigation. There are now about 45,000,000 acres in India thus supplied with water, which is about one sixth of the total area under cultivation. The irrigation of over half of this area has been made possible by the government. Probably nowhere else in the world is irrigation so thoroughly developed as in India.

Improvement in agriculture and transportation

Trade has been increased by improved facilities for transportation. India now has about 60,000 miles of excellent highways and 38,000 miles of railway. How does the latter number compare with that of Canada, which has less than one fortieth as great a population (p. 477)? Trace the route by which one may travel from Calcutta to the capital; to Bombay or to Madras; to Rangoon or Mandalay in Burma.

Although all nations are free to trade with India, the greater part of its foreign commerce is with the British Isles. Name some of the products that you would expect India to send to Britain, and some of those that it might receive in return. Show why the construction of the Suez Canal has been a boon to India. What interest, if any, are the inhabitants of India likely to feel in the fact that the British have accepted the mandate over Mesopotamia?

Ceylon. — The island of Ceylon is a separate British colony. The climate of the island is tropical. The agricultural products therefore include such articles as rubber, coconut products, tea, and spices. Precious stones are also obtained from mines and quarries. Ceylon yields nearly one eleventh of the entire world's production of rubber. Rubber production has increased enormously within the last ten years.

Regions not under British control. — Not all, however, of the enormous area southwest of the summits of the Himalayas is under the direct control of the British. For example, the two small kingdoms of Nepal and Bhutan, shut off from the rest of the world

in the mountainous region north of the Ganges Valley, have maintained their independence.

Facts to be especially well fixed. — 1. The latitude of India compared with that of the United States. 2. Its surface features. 3. The temperature regions of India. 4. Names and locations of three principal rivers. 5. Meaning and importance of monsoons. 6. The population of India. 7. Its leading farm products. 8. Name and location of the capital. 9. Location of Calcutta; Bombay; Madras; Hyderabad; Rangoon.

Problems for independent study. — 1. Compare the basins of the Po and the Ganges. Finnemore, J.: *Peeps at Many Lands: India*, Chapter VII (Macmillan); Carpenter, F. G.: *Asia*, pp. 273, 308 (American Book); Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 278–305 (Ginn). 2. What plans do you think should be undertaken for the relief of a famine-stricken country? 3. Learn about some of the plans that have been followed in India. Huntington, E.: *Asia*, pp. 324–327; Huntington, E., and Cushing, S. W.: *Principles of Human Geography*, pp. 319, 322, 327 (Wiley); World Book, vol. 4, pp. 2946–2948; Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 284–288. 4. How would you expect the natives to prepare against famine, after receiving warning from the Weather Bureau that the southwest monsoon might be very late? 5. What reasons do you see why the rivers of India are of little value for transportation? Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 217, 278; New International Encyclopedia, vol. 12, p. 59 (Dodd, Mead). 6. Why is the Indus Valley much less thickly settled than that of the Ganges? Huntington, E.: *Asia*, pp. 310–316; Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 217, 312–313; Chamberlain, J. F., and Chamberlain, A. H.: *Asia*, rev. ed., p. 117. 7. Compare the number of miles of paved highway in all India with that in some of our states. 8. In proportion to the population, India has now remarkably few large coast cities. Has it many fine harbors about which great cities may develop? 9. How many cities of more than 250,000 people are there in India?

V. The Far East

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Chinese Republic	Republic	4,786,900	396,762,000		
China proper		1,534,400	375,000,000	Hankow	1,627,000
Manchuria		364,000	17,812,000		
Mongolia		1,875,000	750,000		
Sinkiang		550,300	1,200,000		
Tibet		463,200	2,000,000		
Japanese Empire	Limited monarchy	262,300	84,580,000		
Japan		148,800	59,936,000	Tokyo	2,036,000
Chosen (Korea)		85,200	19,520,000	Seoul	297,000
Taiwan (Formosa)		13,900	3,976,000	Taihoku	180,000
Sakhalin		13,900	169,000		
Kwantung (leased territory)		500	979,000	Dairen	181,000

1. The Chinese Republic

Question. — How do the most thinly populated divisions of the Chinese Republic compare in density of population with the most thickly populated of our own states?

Its chief divisions. — The Chinese Republic, as you see from the above table, is much larger than the region ordinarily called China, for it consists of the five large divisions there named, of which China proper is merely one. Find each of these on the map. While the four dependencies contain nearly two thirds of the entire area of the republic, their importance is slight compared with that of China. Fig. 403 shows a striking difference between them in density of population.

There are two explanations of the sparse population of the outlying provinces. One is that most of this area is a lofty plateau, in which are many mountains of great height. (See p. 488.) The region is too cold for a great abundance or variety of crops. The other reason is that much of this vast area is semi-arid or desert. The borders of the plateau of Tibet receive a heavy rainfall, as is proved by the fact that so many great rivers rise there. Find what rivers of China and of India have their headwaters in Tibet and trace their courses to the sea. Little rain, however, falls on the interior of the plateau. Explain why. Mongolia and Sinkiang are vast desert areas, two of which are shown on Fig. 406. What are their names?

Lesser importance of the four dependencies

Most of the people of these four great divisions are nomads, herding cattle, sheep, horses, goats, camels, and yaks. Little agriculture is carried on in any of them except in Manchuria, the most productive province. In southern Manchuria agriculture is already extensive, and other parts are well adapted to this industry.

The chief reason for the importance of any of this territory in the past has been the fact that for centuries the principal routes between China proper and Europe ran across the highlands of Tibet and Sinkiang. Marco Polo reached China by this highland over 600 years ago.

Fig. 426. — A farmhouse in Tibet

Tibet, the highest plateau in the world, has a very dry climate, so that in many parts of it there are no trees or vegetation of any kind. In the southern part, where there is more rain, farming is carried on; and wheat, oats, potatoes, beans, and rhubarb are raised.

Ordinarily when China is mentioned it is the southeastern portion of the vast republic that is referred to. While this includes less than one third of the area of the republic, it is about one half the size of the United States. Its population, however, is nearly three times as large as ours. How does it compare in density with India, as shown in Fig. 403?

The great importance of China proper

Centuries before the peoples of Europe had risen above barbarism, the Chinese had developed a remarkable civilization. The art of printing, the manufacture of gunpowder, the production of raw silk and silk cloth, the

---

Questions on Fig. 427. — 1. Compare the frequency of names of cities in Japan and eastern China with the density of population as shown by Fig. 403. Do they agree? 2. If Japan seeks more territory, where is she likely to look for it? Show that Manchuria and the northern half of Sakhalin Island are regions which she may be expected to desire. 3. If we should abandon the Philippines, would it be difficult for Japan to secure a foothold there?

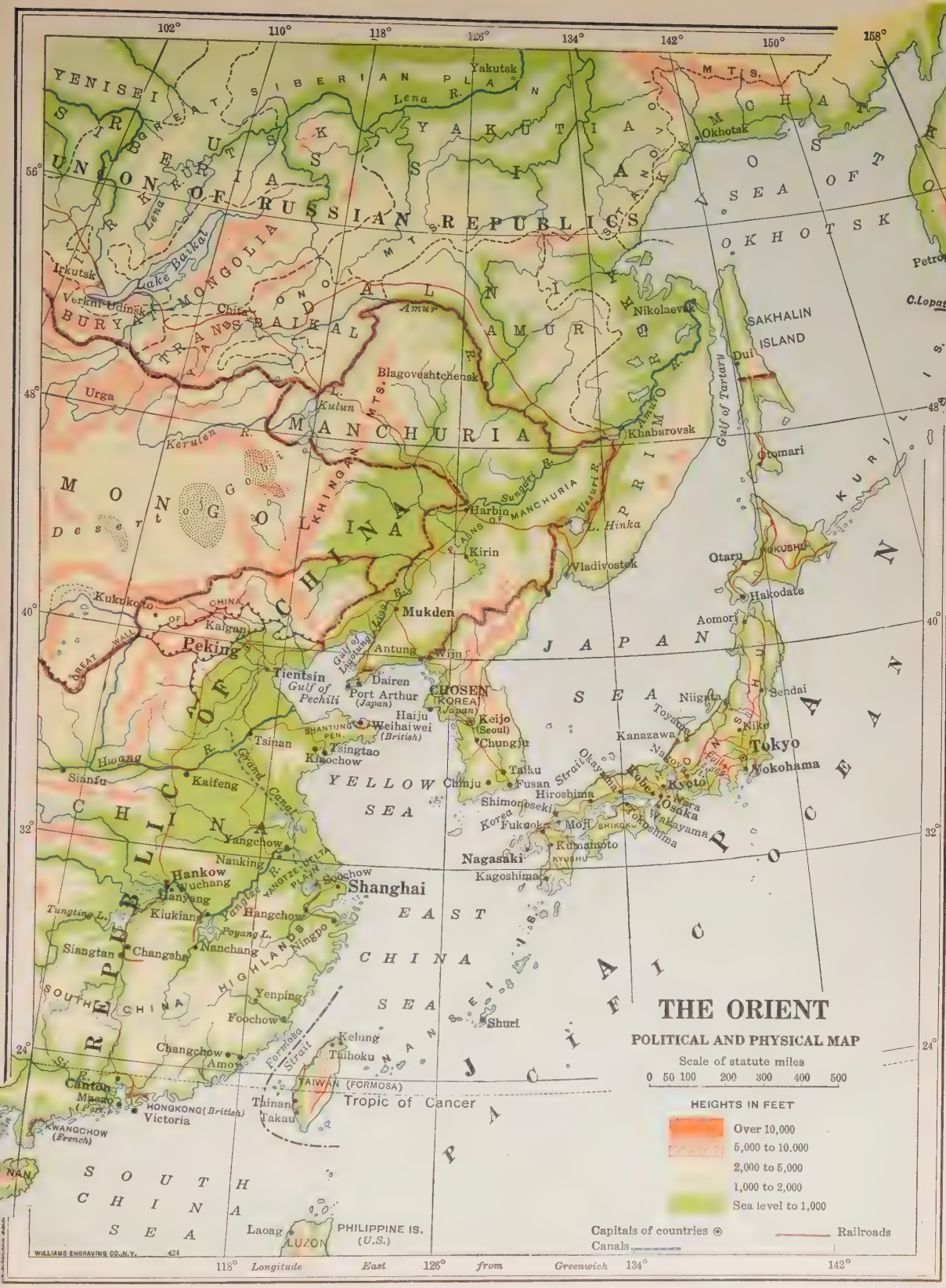

THE ORIENT
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300 400 500
HEIGHTS IN FEET
Over 10,000
5,000 to 10,000
2,000 to 5,000
1,000 to 2,000
Sea level to 1,000
Capitals of countries
Railroads
Canals
Tropic of Cancer
Longitude East from Greenwich
SIBERIA
UNION OF RUSSIAN REPUBLICS
MONGOLIA
MANCHURIA
CHINA
JAPAN
KOREA
TAIWAN (FORMOSA)
PHILIPPINE IS. (U.S.)
YELLOW SEA
EAST CHINA SEA
SOUTH CHINA SEA
PACIFIC OCEAN
SEA OF OKHOTSK
Yakutsk
Okhotsk
Petropavlovsk
C. Lopatka
Irkutsk
Lake Baikal
Verkni-Udinsk
Chita
Blagoveshtchensk
Khabarovsk
Nikolaevsk
SAKHALIN ISLAND
Dui
Otomari
Urga
Kulun
Harbin
Kirin
Mukden
Vladivostok
Otaru
Hakodate
Aomori
Sendai
Niigata
Tokyo
Yokohama
Kanazawa
Nagoya
Kyoto
Osaka
Kobe
Wakayama
Hiroshima
Shimonoseki
Fukuoka
Moji
Kumamoto
Nagasaki
Kagoshima
Chinju
Fusan
Keijo (Seoul)
Chungju
Taiku
Haiju
Dairen
Port Arthur (Japan)
Antung
Wiju
Gulf of Liaotung
Gulf of Pechili
Tientsin
Peking
Kalgan
Kukukoto
Weihaiwei (British)
Tsingtao
Kiaochow
Tsinan
Kaifeng
Siangfu
Hwang R.
Grand Canal
Yangchow
Nanking
Soochow
Shanghai
Hankow
Wuchang
Hanyang
Kiukiang
Tungting L.
Yangtze R.
Poyang L.
Hangchow
Ningpo
Changsha
Siangtan
Nanchang
Yenping
Foochow
Changchow
Amoy
Swatow
Canton
Macao
HONGKONG (British)
Victoria
KWANGCHOW (French)
Kelung
Taihoku
Shuri
Tainan
Takau
Laoag
LUZON
Gulf of Tartary
Amur R.
Sungari R.
Ussuri R.
Lena R.
Yenisei R.
Khingan Mts.
Trans-Baikal Mts.
Great Wall
Kuriles
Formosa Strait
Okayama
Toyama
Fukui
Nara
Shikoku
Kyushu
Nanseis
WILLIAMS ENGRAVING CO., N.Y.

Fig. 427

baking of porcelain or chinaware, and the compass were known to them long before they were known to Europeans.

But that early growth did not continue. In recent centuries the habits of the Chinese have remained almost entirely unchanged, while the civilization of Europe and America has been developing with great rapidity. Not only have such modern inventions as the telephone and the telegraph found little acceptance in China; but modern principles of hygiene are little known, most industries are poorly developed, and but little education is provided for the masses of people.

The great area and population, however, with the immense resources which will be described, assure us that China will always be a country of great importance to the world.

Favorable conditions for agriculture. — Since agriculture is the world's greatest occupation, it is natural to inquire whether or not the conditions are favorable to it. One disadvantage is at once evident — the fact that fully two thirds of China proper consists of highlands and mountain slopes. Locate the mountainous areas on Fig. 427. Note the small amount of lowland along the river courses and in the northeastern section. The uplands are not so high, however, as to interfere seriously with agriculture, and the disadvantage of slopes is largely overcome by extensive terracing.

Note now the other principal conditions. While there is a great variety of temperature, in no section of China proper is the cold so extreme as to check agriculture. In what temperature region is China? What do you note about the quantity of rainfall, as indicated in Fig. 401? Victoria has ninety inches per year; Canton fifty-eight; Shanghai about forty-six; and Peking twenty-four. Locate these cities. Inland areas near by everywhere have from twenty to forty inches, and most of the rain in ordinary years comes in the growing season. Some sections require irrigation, particularly for rice; but their extent is small. On the whole, therefore, temperature conditions are favorable for the growth of crops, and protracted droughts, such as those that occur so frequently in India, are seldom experienced. The soil is likewise very productive, that in most parts of China being classed among the richest soils in the world.

Favorable conditions for manufacturing. — How favorable are the conditions to manufacturing? China ranks second among the countries of the world in the extent of her coal deposits. It is estimated that the United States has 3,000 billion tons of coal, and China one half that amount. Her coal area is many times that of all Europe; and she greatly exceeds even the United States in quantity of excellent anthracite. The coal is widely distributed, too, and some of the best beds are near good waterways. Petroleum deposits also are rich.

Iron ores are abundant, widely distributed, of the very best quality, and in many cases located near coal beds. There is a great amount of copper; and there are extensive deposits of lead, tin, zinc, and antimony, besides some gold and silver.

Moreover, if the English, the French, and the Germans (pp. 291, 313, and 323) are all forced by the density of their population to make a living partly by manufacturing the dense population of China may also be expected to encourage this occupation.

Reasons for lack of progress. — These facts show that the Chinese have had remarkable opportunities for progress. Why, then, have they not made greater use of them? One reason is

The isolation of the Chinese

Fig. 428.—The Tartar wall, Peking

This is a view of the wall surrounding the Tartar section of Peking. It is as high as a three-story house and its top is as wide as a city street. The tower in the distance is at one of the fortified gates. The camel train is one of many caravans that bring food products from the province of Mongolia into this city.

their remarkable isolation. Until the time of Columbus the ocean was almost a complete barrier to contact with distant foreigners, and the Pacific Ocean has been the last of the great bodies of water to be used extensively for travel and commerce. Therefore, the contact of the Chinese with other peoples and particularly with Europeans has until recently been chiefly by land routes, long, difficult, and dangerous, and therefore little used. Thus the people have not had the advantage of contact with outsiders for new experiences and growth.

Communication has also been difficult between the various sections of the country itself. Even today there are only about 9,000 miles of railway in all China. Find on the map where the railway lines are located. How does the total mileage compare with that in the United States (p. 212)?

Poor interior transportation

1. Lack of railroads

Name and locate the three great rivers of China (Fig. 399). Of these the Yellow River or Hwang-Ho is of little importance for traffic except for short stretches, because of the rapids in the upper portions, and the numerous bars in its lower course.

2. Limited water routes

The only large navigable rivers, therefore, are the Yangtze and the Si. The Yangtze is one of the great rivers of the world. Ocean

Photo by Adachi K. Adachi

Fig. 429. — Sailing vessels on the Yangtze River

Some of these *junks*, or small Chinese sailboats, have come for hundreds of miles down the river from the mountain valleys that border the plateau of Tibet, bringing the products of the forest and the gardenlike farms to the large cities on the lower course of the river.

vessels ascend it as far as Hankow, and smaller boats 500 miles farther. It is the chief transportation route of the country. In Fig. 403 note how dense is the population along almost its entire course. Hun-

Photo by Adachi K. Adachi

Fig. 430. — Hauling goods by wheelbarrow in China

The wheelbarrow is one of the chief means of transportation for freight and passengers in the interior of China. The roads in these districts are rarely more than five feet wide and, like the rest of the roads in China, are badly kept and seldom paved.

dreds of native sailing craft, called *junks*, are found on its waters, and many steamboats. Both the British and the Japanese run lines of steamers on this river. In general, however, the amount of traffic upon the rivers is small compared with what might be expected.

In the eastern plains the rivers are supplemented by canals. The level character of the land there, with its loose soil and many lakes and river channels, makes the construction of canals easy. The most important one is the Grand Canal, nearly 800 miles long, extending from Tientsin south to Hangchow. Find it on the map. What other large cities are located on or near it? In some sections of this plain there are many other canals; but in most parts of China transportation by canal is of little importance.

Considering the poor facilities for transportation otherwise, one might at least expect the roads to be highly developed, especially in a region of such dense population. Yet outside the larger cities the highways for the most part are narrow paths along which passengers travel by sedan chair or horseback, and freight or baggage by wheelbarrow or on the backs of porters. Indeed, the last method is very common. It is said that fully 40,000 men and women are employed in carrying tea alone into Foochow, a celebrated port for that product (Fig. 427).

3. Want of good highways

The character of their religion also helps to explain their slow progress. The Chinese are followers of Confucius, who lived about 500 years before the birth of Christ. They are taught to worship their ancestors. Though this of course teaches children great respect for their parents, its effect is harmful in many ways. In worshiping one's ancestors one is led to regard the past too highly, so that changes or improvements of any sort are rejected. Such a belief allows no place for the inventions of science and kills ambition. Foreigners, with their strange customs, therefore, have been unwelcome. What more effective way could be found for blocking all progress?

Character of their religion

Finally, the character of the government has been a serious barrier to progress. For nearly 1,000 years the ruling families have come from the nomad peoples of the northwest; first the Tartars, later the Mongols from Mongolia, and last the Manchus from Manchuria. Although these invaders were not very numerous, they were strong warriors and were able to overpower the peace-loving farmers on the plains of China. The great

Character of the government

Chinese wall (Fig. 431) was built for defense against just such invaders.

Since the conquerors were accustomed to the life of herdsmen and knew little of manufacturing or commerce, they did everything in their power to check the introduction of Western customs. They considered Europeans their inferiors, and for a time closed all the ports, except Canton, to foreign trade; and these remained closed until 1842, when only Foochow, Ningpo, Shanghai, and a few others were reopened.

Recent promising changes. — Changes have been made recently, however, that give great promise for the future. In 1912 the old despotic government was overthrown and a republic established in its place. Yet there are many difficulties in its way, for the great mass of the people have so long been ground down by poverty, ignorance, and superstition that they are incapable of sharing actively in the government and are easily misled. Thus far there has been considerable disagreement among the different sections, and even a little fighting. In particular the northern and southern sections have opposed each other. The location of Peking, the capital, is somewhat unfortunate for the settlement of such disputes. Can you see why?

There have been also important improvements in transportation. The old walls inclosing some of the large cities have been torn down and the ground used for broad streets. New railways have also been undertaken. The Republic has more than 50,000 miles of telegraph lines.

Perhaps the most important sign of progress is the new eagerness of the people to learn from other peoples. Many Chinese are now studying in the United States and other foreign lands.

Fig. 431. — A portion of the Great Wall of China in disrepair

The Great Wall is one of the chief features of interest in China. Although thousands of years old a large part of it is still standing. As you can see from the picture, it crosses hills and valleys in an irregular line because it follows the ridges of the mountains. In some places the wall has fallen down and in other places it has been torn down to allow the passage of railroads and canals.

How so great a population has been able to support itself by agriculture. — How can a population three times that of the United States find support from an area one half as large as the United States? The first answer is that their farming is far more intensive than ours. While our farms average nearly one hundred acres in area, those in China seldom contain more than ten; and a family of six or more persons must often make a living from one or two acres. One American writing about Chinese agriculture reports finding a family of twelve in the province of Shantung supporting itself on only two and a half acres.

Their intensive farming

On such farms almost all the work is done by hand. The long, warm summers in most parts of China allow two or three crops per year to be raised on the same land, some crops often being planted between the rows of others, or being sown very soon after others have been harvested. Not a foot of land is left idle. Gardening, rather than farming, is what we should call it.

Such intensive cultivation makes great demands upon the soil. In our country many farms that have been tilled for only a few generations have become partly exhausted. Yet this intensive method has been followed for twenty, thirty, and even forty centuries in China, and the soil is apparently as fertile as ever. How can this be? The question becomes all the more interesting when we realize that, with few farm animals, the Chinese have little stable manure for fertilization.

How they have kept the soil fertile

First, every possible particle of soil is conserved. Although frequent river floods deposit much sediment over the plains, the Chinese go a step farther and scrape the sediment from the channels of the rivers and canals. This rich soil from distant mountain slopes is carried by hand and spread over the fields often at the rate of seventy or more tons per acre. If one man collects and carries a ton of mud from the canal bank to his adjoining field in three hours, you can estimate how long it would take him at this rate to apply seventy tons to an acre.

1. Conservation of soil

Second, the rainfall is conserved, so that the suspended matter in it is returned to the fields instead of being carried away. This is accomplished by leveling the fields and terracing the steep hillsides, thus preventing erosion or washing of the soil during rains. Likewise, crops are often grown on little ridges, the excess rainfall collecting in the furrows between them.

2. Conservation of water

Waste material, moreover, is saved and used as fertilizer. Daily collections are made of barnyard manure, household waste, and certain ashes, which are carried to the fields and spread about the roots of the plants, thus supplying the very richest kind of fertilizer. Chinese farmers often pay for the privilege of collecting city waste for use as fertilizer on their fields, while in the United States great sums have been spent for sewage systems to carry the same materials to the ocean.

3. Use of fertilizers

Another method of fertilizing the fields is by the use of homemade fertilizers, called *composts*, which were used for centuries before methods were discovered for manufacturing modern fertilizers. The compost stack is built up with alternate layers of canal mud, refuse, and green crops. The whole is saturated with water and allowed to ferment from one to six months. The work of preparing, carrying, and spreading this material involves an immense amount of labor.

Still another method of enriching the soil is by crop rotation. Rice, barley, and other crops, which take nitrogen from the soil, are regularly followed by crops of clover, soy beans, or other vegetables which return nitrogen to the soil. They are usually plowed under and thus in still another way turned to account in fertilizing the land. The great value of the soy bean in American agriculture (p. 112) was learned chiefly from the Chinese. In the case of mulberry orchards, there is a regular exchange of top soil between the orchards and rice fields, since it has been found that soil long used in orchards benefits

4. Rotation of crops

the rice, while soil on which rice has grown benefits the orchards. From such facts as these what opinion do you form of the energy and intelligence of the Chinese?

The climate permits a large variety of farm products. In the north and in the highlands of the west wheat, barley, corn, and millet are the common grains; while great quantities of potatoes, peas, beans, and other vegetables are raised. Farther south rice takes the place of these grains and is the principal food. The most productive sections for rice are the deltas of the Hwang and Yangtze rivers.

Their great variety of agricultural products

1. Food crops

The common notion that rice is almost the only food is quite wrong. It merely takes the place of wheat bread for many of the inhabitants. Aside from our common vegetables the Chinese eat many plants that we regard as weeds and do not eat. The chief meat is pork, which is found in all parts of China and eaten by all classes. Any one who has a back yard raises chickens and ducks. Fish also is a very common food.

Tea is one of the important crops, the most productive areas being in the southern highlands. The tea plant is a small shrub. It is often grown about the home, so that this is, for the most part, a household or garden industry. There are few large tea plantations such as are found in India and Ceylon. While the latter regions are capturing the world markets for black tea, China continues to hold its own in the production of the finer qualities.

For more than 2,000 years China has been famous for its silk; for centuries it enjoyed a monopoly of that industry. It still supplies more than thirty per cent of the raw silk of the world, the greater part of which is produced in the homes of the small farmers in and near the Yangtze Valley. The picking of the mulberry leaves, the feeding and care of the silkworm, the reeling of the flimsy silk fibers, and the spinning of several fibers into a strong, elastic thread require painstaking, skillful workers. It is an industry, as we saw on p. 315, that can thrive only in densely settled regions where labor is cheap. China meets these conditions to an unusual degree.

2. Crops of raw material for manufacturing

© *Publishers' Photo Service*

Fig. 432. — Grinding rice for flour, China

This illustrates one of the methods used in the interior of China for the grinding of rice into flour. The base is of stone and mortar; its surface is covered with a thick layer of cement to make it smooth. The roller is a cylinder of stone. In the larger towns and cities, mills run by machinery are now used.

One other crop that is especially important for supplying raw material for manufacturing is cotton. As might be expected, it is grown in the east central part of the country. Compare the temperature and rainfall conditions here with those in the Cotton Belt in the United States.

Thus China resembles the United States in producing so great a variety of crops that it is largely independent of other regions. There is, however, one very striking difference between the two countries. As we have seen (p. 413), the transportation between one

district and another in China is usually so poor that there can be little exchange of products. On that account the people in one section may be dying of starvation while those in another are enjoying plenty. This explains why, with so dense a population, famines have been frequent. In the winter of 1920–1921 several extensive areas suffered from severe famines.

© *Publishers' Photo Service*

Fig. 433. — Northern entrance to the harbor of Hongkong

Hongkong, a British island possession, situated at the mouth of the Canton River, is only about eleven miles long and from two to five miles wide. The city on Hongkong Island is called Victoria. The island is so mountainous that the streets are built in terraces on the sides of the cliffs. All British ships sailing on the Pacific and Indian oceans stop here for a week. The harbor is strongly fortified and an important naval and military station.

The danger threatening China from other nations. — The existence of China as a separate nation has long been threatened by other countries. The map indicates that several important points on the coast of China are now in the possession of other countries. Name these, give their approximate positions, and state the countries to which they belong.

Chinese territory that has been taken by other nations

The large island of Taiwan (Formosa) (Fig. 427) was taken from China by Japan in 1895.

Several of the other large cities along the coast, including Canton, Foochow, Hangchow, and Shanghai, contain sections under the control of foreign countries where extensive commerce is carried on. Locate these ports.

The Japanese have also claimed many privileges in Manchuria and have taken possession of much of that region, including with it Mukden and Port Arthur. During the World War they also wrested from Germany the control it had exercised since 1898 over Kiaochow and much of the Shantung Peninsula. Since Germany had no real right here, many nations insisted that Japan was morally bound to restore Shantung to China. She did so in 1922.

What do these nations want in China? They see great opportunities for future trade. While the masses of the Chinese have low standards of living and therefore few wants, they are nevertheless learning to use many of the products of Western nations. The immense population, equal to about one fifth of all the inhabitants of the earth, insures an enormous import of foreign wares.

What these nations want in China

Production of minerals at present is slight; but the deposits are very extensive, as we have seen, and as mines are opened up manufacturing will increase. Foreigners will undoubtedly play an important part in the development of the mines and factories.

Again, as the resources of the country are developed and the imports are multiplied, the need of railroads and harbor improvements will be almost unlimited. Railroad franchises, therefore, are likely to prove extremely profitable.

Benefits to the Chinese

While foreigners are thus thinking of profits to themselves, not all the benefits are on one side. The foreign settlements have modern improvements, which are an object lesson for the people about them. Can you name some of the benefits that are sure to follow?

The opening of the mines and the establishment of factories will not only give employment to many Chinese, but will raise their standards of living by increasing their comforts; and along the railroads will flow the commerce that will bring new life to the almost changeless China of the past.

Unselfish attempts of foreigners to aid China. — The United States has adopted a very different policy toward China from that of other nations. It has taken a vigorous stand in favor of preserving her territory and independence. America has been China's best friend among the nations.

Missionaries and educators have also given great aid to China. About 7,000 Europeans and Americans connected with missions — priests, ministers, teachers, and physicians — are to-day laboring there. There are about twenty-five colleges attached to the missions, more than one hundred normal schools, and several thousand elementary and high schools.

© Adachi K. Adachi

Fig. 434. — A Chinese school in northern China

This school for boys is in a Chinese temple. Until recently there was no public-school system in China and few of the people could read or write. Now, however, both boys and girls are being educated, and many temples have been taken over for school purposes. In addition to the public schools, there are many private schools, where the pupil pays from $1.00 to $2.00 a year. In each of the large towns and cities, there are missionary schools and colleges.

Facts to be especially well fixed. — 1. The names and locations of the five divisions of the Chinese Republic. 2. Area of China proper compared with that of the United States. 3. Character of the surface of China. 4. The climate. 5. Mineral deposits. 6. Names and locations of the three principal rivers of China. 7. Location of Peking; Tientsin; Kiaochow; Port Arthur; the Grand Canal; Shanghai; Foochow; Hongkong; Canton. 8. Principal agricultural products.

Problems for independent study. — 1. Wood is scarce in China. In what ways must that fact hinder progress? Smith, J. R.: *Industrial and Commercial Geography*, p. 452 (Henry Holt); Chamberlain, J. F., and Chamberlain, A. H.: *Asia*, rev. ed., pp. 71–72 (Macmillan). 2. There has been opposition to the introduction of machinery into China. What reasons for this can you suggest? Carpenter, F. G.: *Asia*, pp. 145–153 (American Book); Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 80–81 (Ginn); Chamberlain, J. F. and A. H.: *Asia*, rev. ed., p. 79; Whitbeck, R. H.: *High School Geography*, pp. 552–554 (Macmillan). 3. The poppy used to be a very important farm product in China. Find why its cultivation has been checked. Winslow, I. O.: *Distant Countries*, pp. 72–74 (Heath); Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 52–54. 4. Chinese fishermen are very ingenious in catching

fish. Describe some of their methods. World Book, vol. 1, p. 1583, under "Cormorant"; National Geographic Magazine, vol. 36, pp. 258, 261. 5. Note that the Grand Canal crosses both the Hwang and the Yangtze rivers. How can a canal cross a river? Herbertson, F. D. and A. J.: *Descriptive Geography of Asia*, pp. 236–239 (Macmillan); Allen, N. B.: *Geographical and Industrial Studies: Asia*, pp. 24–25; Herbertson, A. J.: *Asia*, pp. 236–240 (Macmillan). 6. There are many great cities in China. How do you imagine they obtain their daily supplies of food, when means of transportation are so poor? Carpenter, F. G.: *Asia*, pp. 168–176, 196; Chamberlain, J. F., and Chamberlain, A. H.: *Asia*, rev. ed., pp. 72–76, 91–92, 96. 7. Describe the method of preparing tea. Huntington, E.: *Asia*, pp. 276–277; Carpenter, F. G.: *Asia*, pp. 90, 186; Allen, N. B: *Geographical and Industrial Studies: Asia*, pp. 77–85; Smith, J. R.: *Commerce and Industry*, pp. 444–446 (Henry Holt). 8. Look up in a history the story of the Boxer Rebellion in 1900. The money award, or indemnity, given to the United States was in excess of the damage. What did this country do with the surplus?

Fig. 435. — Fuji

Fuji, at one time an active volcano, is about seventy miles from Tokyo. What is its height (p. 488)? Its snow-capped cone is visible for many miles from land and sea. It is worshiped by the Japanese, many of whom make pilgrimages to its summit during the months of June and July. The imperial railroad connecting Tokyo and Kyoto passes by its base.

2. The Japanese Empire

The former isolation of Japan from the rest of the world. — During the sixteenth and the early part of the seventeenth centuries, European missionaries to Japan won so many converts to Christianity and European merchants visited that country in such large numbers that the Japanese Emperor became afraid of foreign influence. For that reason practically all foreigners were shut out of Japan; and the Japanese were forbidden, on pain of death, to go abroad. The larger Japanese ships were destroyed and no boat of more than fifty tons was allowed to be built. From that time until 1854 Japan was almost completely isolated from the rest of the world.

Means of securing an adequate supply of food. — In such circumstances no food could be imported. Yet there were as serious difficulties in the way of farming then as now. The rainfall is abundant, nearly sixty inches annually at Tokyo, the capital. The temperature is likewise favorable; there are usually only a few very cold days throughout the winter in Tokyo, which is near the central part of the empire.

The difficulty of getting sufficient food from the soil

The great difficulty in the way of farming lies in the rough surface of the country. The highest mountain peak is the volcano Fuji, which is over 12,000 feet above sea level; and while most of the other mountains are much lower, there are so many that only about one sixth of the total area can be cultivated. How does that compare with the cultivated area in Iowa (p. 54)?

Nevertheless, by intensive farming a large quantity of food is raised. Since the spade

Fig. 436

Fig. 437

From The Geography of the World's Agriculture

largely takes the place of the plow, and all work is done by hand, one man can till only a very small plot of ground. The usual size of a farm to-day is little more than one acre; and a farm of twelve acres is exceptionally large.

The principal crop, and therefore the most common food, is rice. Other common crops are wheat, barley, and potatoes. The great importance of these foods in Japan is shown by the fact that meat is not common, and that little use is made of milk, butter, or cheese.

The lack of other food makes the demand for fish very great. Japan is an ideal country for fishermen. The sheltered water of the inland sea between Honshu and Shikoku, the widely different depths of water about the islands, the warm ocean current moving north along the eastern side (Fig. 250), and the cold current moving south along the western side, all lead to a great variety and abundance of fish. Fish is one of the most common foods, and is generally eaten with rice.

The great importance of fish

The influence of the Western world in Japan. — In 1854 Commodore Perry of the United States Navy entered one of the harbors of Japan with a squadron of American vessels and succeeded in securing a treaty of friendship and commerce. Other nations quickly followed, and by 1868 Japan was fully opened to trade and communication with the rest of the world.

Since that time, instead of preventing the introduction of Western ideas, the Japanese authorities have encouraged it. They have invited many foreigners to Japan as teachers, and they have sent hundreds of their young men and women to Europe and America to study. In consequence, a remarkable change has taken place. While the nation had stood still for 250 years, its progress since 1868 has probably surpassed that of any other nation in the same length of time.

The change of feeling toward foreigners

Although there had been an abundance of coal in the islands, very little was formerly mined, for its principal use had been for domestic purposes and for the evaporation of sea water to get salt.

Progress in mining

Fig. 438. — A fish peddler in Tokyo

This shows the favorite method of carrying freight in Japan. Vegetables, grain, and fish are handled in this way. The man in the picture is a Japanese coolie, the name given to the native unskilled laborer. Coolies go barefoot throughout the year, wearing straw sandals only when the roads are rough.

Fig. 439. — Osaka and Kobe

Osaka is the largest manufacturing city in Japan. It has many cotton mills. The white line shown in the figure marks the course of a canal across the city. Kobe, the chief seaport at the entrance to the inland sea, has a natural harbor with vast warehouses. Kobe is an important educational center.

Under the influence of Western ideas mining became important. By 1923, 31,900,000 tons of coal were being produced annually. With the aid of American machinery and American methods of securing it, petroleum has become another valuable product. Japan ranks next to the United States and Chile in the output of copper, even exporting that metal to Great Britain and France. The iron deposits, however, are not extensive.

Progress in manufacturing

While the people had done enough manufacturing to meet their own necessities, the work was almost entirely by hand. Every household had its spinning wheel and loom for weaving, which were kept busy all day long. There is still a large amount of handwork in the homes, not only in textiles, but also wood carving, lacquer work, and porcelain. Under the influence of the West, however, there are now many factories with modern machinery. The textile industry leads; there is so much spinning and weaving in Osaka that that city is sometimes called the Manchester of Japan. Why is this name appropriate (p. 292)? Foreign lands have stimulated Japanese manufactures in two other ways in addition to supplying modern machinery: they have furnished many raw materials that are needed, and have become markets for their finished products. Much cotton is now exported from our Southern States to Japan.

Progress in means of transportation

A common method of transportation in Japan is by *jinrikisha*, meaning a small two-wheeled vehicle drawn by men; and even heavy bales of cotton are carried on the backs of Japanese laborers or *coolies*, who perform many tasks done in Western countries by beasts of burden. Yet the country has nearly 10,000 miles of railway, which is a large mileage, considering the difficulty of building railroads in so mountainous a country. Trolley cars are common, also, in the cities.

Fig. 440. — Tokyo and Yokohama

Tokyo is an important railway center. It is connected by railway with Yokohama, eighteen miles to the south, which is its real port, since the harbor at Tokyo is too shallow for ships of large tonnage.

No point in Japan is more than a hundred miles from the sea; and on account of the mountainous character of the country most of the dense population lives within twenty-five miles of the coast. Many fine harbors encourage navigation. Thus the Japanese are a seafaring race; their ships now call at all the principal ports of the world. Shipbuilding has become one of the important industries of Japan. Though most of their

steel ships have thus far been purchased abroad, they are now building their own. Their leading seaport, Yokohama (the port for Tokyo), was almost entirely destroyed in the great earthquake and fire of 1923. It is being rebuilt. Kobe, Osaka, and Nagasaki are other important ports.

The great problem that Japan is facing, and her proposed solution. — The great problem that Japan has to face is how to feed her dense and rapidly increasing population. She has nearly 60,000,000 persons in an area less than that of California; and although only one sixth of the surface can be cultivated, agriculture is by far her most important industry. In order to get the largest possible yield the fertile, irrigated valleys are divided off into fields hardly larger than a city lot, where vegetables and grain, particularly rice, are grown. In addition, the hills and even many of the mountains are terraced, as in China, the terraces sometimes extending nearly, if not entirely, to the top. In any farming section one may count from fifty to a hundred peasants at any time of day working in the fields within a radius of half a mile. Men, women, and children work together.

Why Japan desires colonies

Considerable progress has recently been made in mining and manufacturing, as we have seen. But these industries have reached no such development here as in the leading European countries, and it is doubtful whether they ever will.

What, then, is Japan to do? She has become convinced that colonies are a necessity. She wants them for several reasons: for the sake of more land for agriculture, for raw materials for manufacture, as a market for her manufactures, and as homes for a portion of her population.

Feeling this need, she has added several regions to her possessions during the last quarter of a century. One is the fertile island of Taiwan, far to the southwest of Tokyo (Fig. 427). Here tea is the principal product; much of our better grade of tea comes from this island.

Her recently acquired territory

Fig. 441. — Pumping water for irrigation, Japan

This man is turning a water wheel which lifts the water from the stream into the rice, or paddy, fields shown in the background. Rice is grown in a plot of soft mud, often about the size of a tennis court, inclosed with low, narrow embankments, the sides of which are planted with beets and vegetables.

A larger colony, secured later, is the peninsula just west of Tokyo formerly known as Korea, but now called Chosen by the Japanese. It has a population of about 19,500,000, chiefly engaged in agriculture.

Rice and cotton are leading crops. What is the chief city?

We have already (p. 418) referred to the temporary possession by Japan of one of the most desirable portions of China — Kiao-chow and the Shantung Peninsula; also to the power that she has acquired in Manchuria. She has been bold in asserting claims on the mainland; and it is plain that she is already the controlling power in eastern Asia and is likely to remain so.

© E. M. Newman

Fig. 442. — A valley in Korea

These Korean villages show many houses with thatched roofs and a few more modern ones with tiled roofs. Most Korean houses are built around three sides of a rectangular court; hence the shape of the roofs in the picture. The streets are narrow, unpaved, and without sidewalks.

As a relief from the overcrowded population in Japan these colonies have thus far proved a failure. The Japanese do not seem inclined to emigrate to the colonies, where living conditions are worse than in Japan. Up to 1924 almost 600,000 had left the mother country. Of these 200,000 had gone to China, 200,000 to the United States and the Hawaiian Islands (p. 175), and 150,000 to Australia. Her colonies had attracted very few settlers. As a source of raw materials, however, and as a market for Japanese manufactures the colonies are proving important.

The usefulness of these lands to her

Prospect that Japan will rival Britain in industry and commerce. — Japan has been called the England of the Orient. Both the area and the population of her islands are greater than those of the British Isles (p. 477). The location of Japan opposite China corresponds to that of Great Britain opposite Europe. Its location between China, whose population is three fourths as large as that of all Europe, and the United States corresponds to that of Britain between Europe and America. Tokyo and Yokohama lie on the great traffic route from Vancouver, Seattle, and San Francisco to southern China, the Philippines, and the East Indies. This position makes food and raw materials for manufacture easily available, secures good markets for manufactured articles, and gives Japan an opportunity to be the chief carrying nation of the Orient.

Advantages of location compared with those of Britain

While, unfortunately, Japan produces little iron ore, her supply of coal, copper, and petroleum is large, as already stated (p. 422). She already mines more than one tenth as much coal as Britain, and the amount is rapidly increasing. Her rivers, also, are capable of furnishing much

Abundance of raw materials and of power for manufacturing

more power than those of Britain. The abundance of raw silk, made possible by the extensive cultivation of the mulberry tree and the large supply of cheap labor, encourages the manufacture of silk fabrics. These advantages, together with the variety of her raw products due to her varied climate, insure a promising future for manufacturing.

Handicaps in comparison with Britain

Japan has always been poor, and is still in great need of capital for the development of her industries. In that respect she is very inferior to Britain. Again, while the country has adopted Western civilization to a surprising degree and has prospered wonderfully, the condition of the mass of the people has been little improved. They are without an uplifting religion. There is little respect for women, twice as many women being employed in industry as men; and large numbers of children are regularly engaged in labor. Long hours and low wages make the cost of production low and lessen the efficiency of the workers. On the other hand, the Japanese have not only imitated Europeans successfully; their keen artistic sense has given them a world market for many of their wares.

The government is in the hands of a very few men, who are responsible to the Emperor alone. It somewhat resembles that of Germany before the war, the Emperor being known as the Mikado. While the government has introduced numerous improvements, such for example as the establishment of experimental farms and the development of dairy cattle, it has also insisted upon a large army and navy. That means enormous expense, even though the country is already poor. The British army, on the other hand, has always been small in times of peace.

Japan's successes in recent wars show that such expense has not been incurred for nothing. She has resembled the Germans in her inability to get on with people she has conquered, for the Koreans are dissatisfied with Japanese rule. Yet her return of Shantung to China (p. 418) shows that she desires the respect of other nations. What are her plans for the future? This is one of the interesting questions of to-day.

© Keystone View Co.

Fig. 443. — Making pottery, Japan

The making of pottery is one of the important industries of Japan. The pottery works at Satsuma have for many years produced some of the finest vases in the world.

Facts to be especially well fixed. — 1. Names and locations of the principal islands. 2. Location of the capital; Yokohama; Osaka; Kobe; Nagasaki. 3. The chief products. 4. Names and locations of foreign possessions.

Problems for independent study. — 1. Why have the Orientals not been welcome as immigrants

on our Pacific coast? Encyclopedia Americana, vol. 6, p. 554. 2. Why has Japan benefited so much more than China from contact with Western civilization? Smith, J. R.: *Commerce and Industry*, pp. 453–456 (Henry Holt); Encyclopædia Britannica, vol. XV, p. 237; Whitbeck, R. H.: *High School Geography*, pp. 544–549 (Macmillan). 3. If the Japanese do not seem to you to have found the right solution for their overcrowded condition, what other do you think of?

VI. Southeastern Asia and the East Indies

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Indo-China (Including the Malay Peninsula):					
French Indo-China	French dependency	257,100	19,844,000	Cholon	234,000
Siam	Monarchy	200,100	9,724,000	Bangkok	746,000
Federated Malay States	British colony	27,600	1,418,000	Kuala Lumpur	80,000
Non-federated Malay States	British colony	23,500	1,123,000	Johore Bharu	15,000
Straits Settlements	British colony	1,600	961,000	Singapore	350,000
Borneo:					
Northern section	British protectorate	77,100	883,000		
Southern section	Dutch colony	206,800	1,626,000		
Total		283,900	2,509,000		
Celebes	Dutch colony	72,700	3,108,000		
Java	Dutch colony	50,700	34,984,000	Batavia	254,000
New Guinea (Western section)	Dutch colony	160,700	195,000		
Sumatra	Dutch colony	163,100	5,852,000		
Other Dutch East Indies	Dutch colonies	79,600	3,585,000		
Philippine Islands	U. S. dependency	115,000	10,314,000	Manila	285,000

The control of European nations over this region.—The name Indo-China indicates the region between India on one side and China on the other. Judging from its thin population (Fig. 403), one might suppose it to be a less attractive region than either India or China; and this statement applies even more fully to the peninsula extending far to the south, known as the Malay Peninsula.

Yet European nations take an active interest in this area. Burma, as we have already seen, is British territory. So also is most of the Malay Peninsula. Note the names of its divisions. The eastern portion of the main peninsula is French; and although Siam is shown on the map as an independent nation, the British and French have to a large extent taken over the actual government.

Why Europeans want this control.—Why do they want it? Why it is unattractive we can readily see from Figs. 398 and 401, which indicate the temperatures that prevail here and the extent of the rainfall. It is thus seen to be a very unhealthful place for the white man, threatening him with cholera, fever, dysentery, and other tropical diseases. It is likewise too mountainous (Fig. 399) in many sections to be favorable to agriculture.

The attractions are not so evident; yet they are great. Fig. 402 shows how very extensive are the tropical forests, consisting of teak, rosewood, ebony, ironwood, dyewood, and many other varieties of trees. Practically all tropical and subtropical crops likewise flourish here, including rice, sugar cane, cotton, tobacco, spices, and fruits.

In recent years rubber plantations have been developed with great profit. The suitable soil and climate and the large supply of cheap labor have made this region the world's chief source of crude rubber. More than four fifths of the world's supply comes from an area including Ceylon, the Malay Peninsula, the Dutch East Indies, and the tropical Oriental lands. Brazil now supplies less than one tenth of the world's production. The cost of rubber in Brazil is estimated at about thirty-three cents a pound, while in this region it is from twenty-five to thirty cents. Suitable land is still available for such plantations, and it will doubtless be used as the demand for rubber is constantly increasing.

The minerals are hardly less important than these other products. More than one half of all the tin in the world already comes from this region; and it contains large quantities of coal, iron, zinc, and lead. European nations require all these products, and the need is found to increase as the years pass. The inhabitants of this region, also, as they advance in civilization, will afford an increasing market for the manufactured products of Europe.

© Keystone View Co., Inc.

Fig. 444. — A scene in French Indo-China

Indo-China has a damp, hot climate, favorable to the growing of palm and rubber trees. Bamboo, out of which the natives build their houses, grows here; and so does cinnamon. The inhabitants wear cone-shaped hats, which serve to shade the face from the hot sunshine, and, in the wet season, to shed the heavy rains.

Why Singapore is the best-known city in this region. — There are several large cities here, of which Rangoon, Bangkok, and Singapore are the most prominent. Locate each. Bangkok, the largest, has a population of 746,000, but Singapore, in the Straits Settlements, is the best known and probably the most important, though almost on the equator. Its location on important transportation routes is its greatest advantage. On Fig. 495 point out the steamship routes that lead past this point. Owing to this advantage it is, perhaps, the greatest center of commerce in the Orient. Quantities of rice reach it from the mainland and neighboring islands for shipment to Europe; other articles of export are tin, rubber, and spices. The largest tin smelter in the world is located near the city. The principal articles imported from Great Britain are cotton goods, iron and steel, machinery, and tobacco, which are distributed northward.

Its favorable location and excellent harbor have made Singapore a great British naval base. There are dry docks and machine shops for repairing large vessels, and it is an important coaling station. On Fig. 495 show how favorable its location is for the defense of British possessions in the Orient.

Importance of the East Indies.— Compare the areas and populations of the chief islands of the East Indies (p. 477) with those of some of our states. With the exception of New Guinea they were probably once a part of Asia, and were originally peopled with Malays from that continent. The natives of New Guinea, however, as well as its plants and animals, resemble those of Australia, with which it was probably once connected.

Fig. 445. — Collecting the latex of the rubber tree, Sumatra

This is a rubber plantation. All the trees are rubber trees that have grown up from saplings that were planted. The *latex*, or rubber milk, is obtained by making a slit through the bark of the tree. The latex runs out of this slit and is collected in a small cup attached to the tree. Where do you think they are taking the latex? There are large rubber plantations in Ceylon, Sumatra, India, Formosa, Indo-China, and Malay Peninsula. Most of the rubber used in this country comes from the East Indies. What is the chief use of rubber now? What South American country produces rubber? It now produces only a small portion of the rubber used in the world.

All these islands are mountainous. In fact, they are, like the Hawaiian Islands, (p. 174) parts of mountain ranges rising out of the sea. Among them are many active volcanoes, some of which have had violent eruptions in recent years. Since they lie so near the equator, all of them have tropical temperatures and a heavy rainfall. In the low parts they are unhealthful and are covered with dense jungle; but the decomposed lava of the lower mountain slopes ranks among the most productive soils in the world. Among the best-known products of the East Indies are pepper, cloves, and nutmegs. But under the teaching of the white men, particularly the Dutch, great advances have been made in other lines of agriculture. These islands now export large amounts of sugar, rice, coffee, rubber, camphor, and many valuable woods.

The island of Java is one of the leading regions of the world in the production of sugar cane and coffee. With an area slightly greater than that of New York State, Java supports 35,000,000 people. How does that compare with the population of New York State? The islands of Borneo and Sumatra are not so thickly settled, but their immense areas offer great opportunities for the production of tropical goods for the Western world.

How we came into possession of the Philippine Islands. — The year 1898 marked a very important change in the policy of our government in regard to outlying possessions. Though we had held Alaska for a good many years, many of our people had felt that we wanted no more foreign ter-

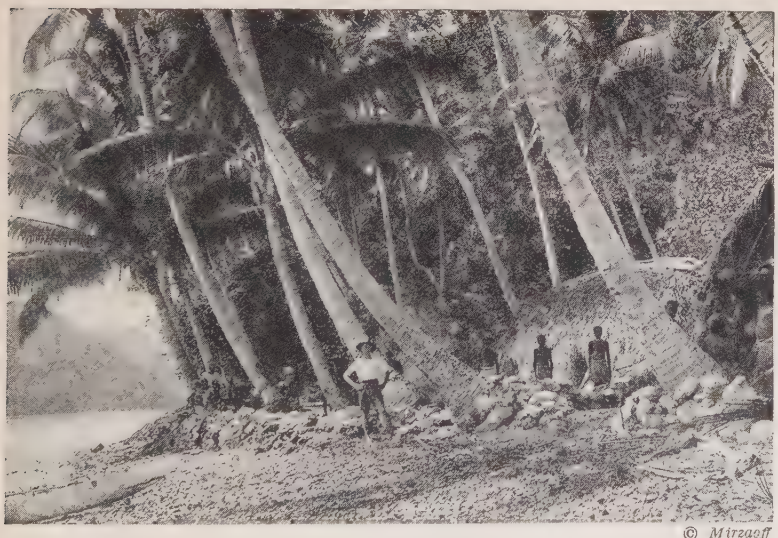
ritory. We already had enough agricultural land to satisfy our needs, and it was felt that any additions would only increase our difficulties and possibly entangle us in disputes with other nations.

In 1898 we defeated Spain in the West Indies, and Admiral Dewey destroyed a fleet of Spanish warships in the harbor of Manila. As a result of this war Porto Rico came into our possession (p. 167), and, by the payment of $20,000,000 to Spain, the Philippine Islands as well. The inhabitants of these islands were not in a condition to govern themselves, and we were unwilling to allow them to be further misgoverned by Spain. We therefore took charge of them ourselves, against the active opposition of many of our citizens.

Fig. 446. — The Straits Settlements

The value of their products. — The location of the Philippine Islands suggests a close similarity in products to our other tropical possessions. How does their latitude compare with that of the Hawaiian Islands and of Porto Rico? Recall the agricultural products of those islands (pp. 174 and 201). As in their case, much of the soil in the Philippines has been formed by the decay of lava and is in consequence very fertile. As might be expected, there are advantages for sugar production similar to those in the Hawaiian Islands and Porto Rico; in recent years sugar refineries have been built and refined sugar has replaced raw sugar as an export. With the establishment of refineries it has been possible to reorganize the sugar industry and to produce sugar of a superior grade. Rice, corn, and coconuts are other exports. The coconuts are raised in great quantities in the interior and shipped down the rivers on rafts

Of their agricultural products



© Mirzaoff

Fig. 447. — A home on the coast of New Guinea

New Guinea, a very mountainous island, abounds in forests of camphor, banana, and breadfruit trees. The interior of the island is so wild that little is known of it. Even its coast line is sparsely settled, the native population averaging about two to the square mile. The few white inhabitants there have started rubber, cotton, and coconut plantations, and have developed an important gold-mining industry.

to the towns to be dried (Fig. 448). *Copra*, the dried meat of the coconut, is sent to Europe, where it is used in making soap. The oil obtained from the nuts is used in place of lard and kerosene. Tobacco is also grown and manufactured into cigars at Manila. These islands supply the world with its best grade of hemp, known as *Manila hemp* because it is exported from Manila. The natives make it from the fiber of the wild plantain, which closely resembles the banana tree. This is used in the manufacture of rope, and is the most important export of the islands.

© *Publisher's Photo Service*

Fig. 448. — Transporting coconuts by water in the Philippines

The nuts, owing to their spongy covering, float readily. A large number are tied together to form the base of the raft and others are thrown upon them. The rafts in the picture are being floated down one of the streams to Manila, where the nuts are manufactured into coconut oil and a variety of other products, including oleomargarine.

The importance of the agricultural prospect can be appreciated when the area of these islands is compared with the combined area of all the West Indies (pp. 477 and 481). Only about one twelfth of the total area of the islands is under cultivation; and although the mountains reach a height of nearly 10,000 feet, a large part of the surface is suitable for cultivation. Agriculture is still in a somewhat primitive condition, but the methods of tilling the soil are rapidly being improved, and it is certain that the farm products will soon be very greatly increased.

What do you remember about the forests and minerals in the West Indies? Lumbering in the Philippines has been hindered by the great distance of these islands from the markets of the world; but as the supply in our own and near-by countries decreases, it is likely that it will pay to export timber from the Philippines. Our government has already set aside three tracts as forest reserves, to insure a permanent supply of timber. Forests cover a large part of the archipelago, for trees thrive there, often forming tropical jungles. There are about 40,000 square miles furnishing timber, gums, resins, dyewoods, and tanbark. One of the most valuable products is rattan, which the natives use in making rope, houses, canoes, carts, beds, and many other articles. The bamboo is also very valuable. This tree grows from one to eighteen inches in diameter and from five to seventy feet in height. How have you seen bamboo used? The government is growing rubber trees also on areas that are to be reforested.

Of their forests

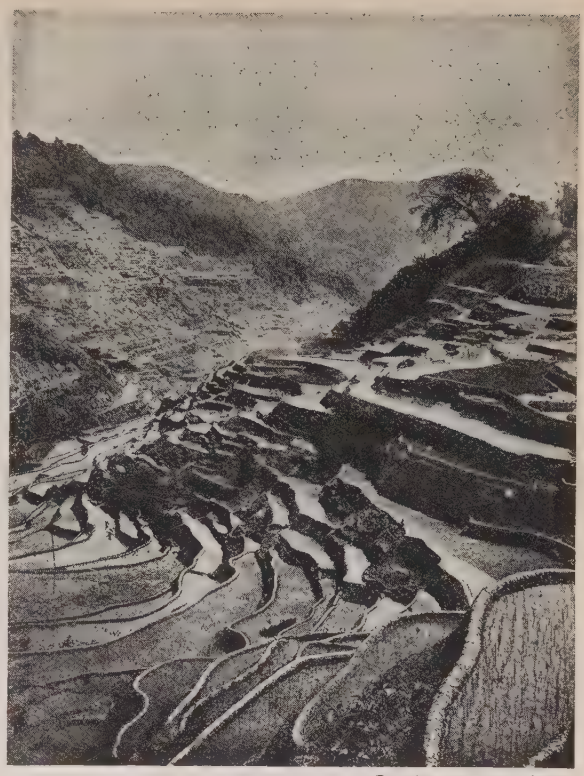
The gold deposits were one of the attractions to the early Spaniards. Gold is found on almost all the larger islands and is at present the most valuable mineral product. The copper deposits

Of their minerals

have long supplied the natives with copper for their implements. There has been little development as yet of the many other valuable minerals on the islands. Silver, platinum, petroleum, and sulphur have been found, and several of the islands have deposits of iron ore. It is probable that in time the Philippines will have extensive manufactures of iron and steel.

Benefits that our government has brought to the Philippines. — There are more than 7,000 islands in this group, nearly half of which are too small ever to have been named. Two of the islands, on the other hand, are each as large as the state of Indiana. Note their names. Upon which one is Manila located?

The population is composed of two very different races: (1) the aborigines or original inhabitants; and (2) the Malays. The former, a race of small dark-skinned people, are called *Negritos*, a Spanish word meaning *little Negroes*. They have been forced by the more powerful and intelligent Malays to retreat to the mountainous regions. The population was formerly divided into many tribes, widely scattered on many islands. Each of the chief tribes had a language of its own, and understood little of the language or customs of other tribes. They were frequently at war. Estimate the distance between Luzon and Mindanao. Even the tribes on the large islands were separated from one another by mountains and by lack of roads and often lived in hostility to one another. Under Spanish rule these conditions were but little improved.



© *Publishers' Photo Service*

Fig. 449. — Rice terraces in the Philippines

© *Mirzoff*

Fig. 450. — Drying the fiber of Manila hemp in the Philippines

Hemp fiber is made from the leaves of a palm. More efficient methods of drying fiber are now coming into use.

What has been our plan of procedure with reference to the natives, and what have we accomplished? We have endeavored to do three things. First, we have attempted to educate these people. Never, perhaps, has education been

Educating the people

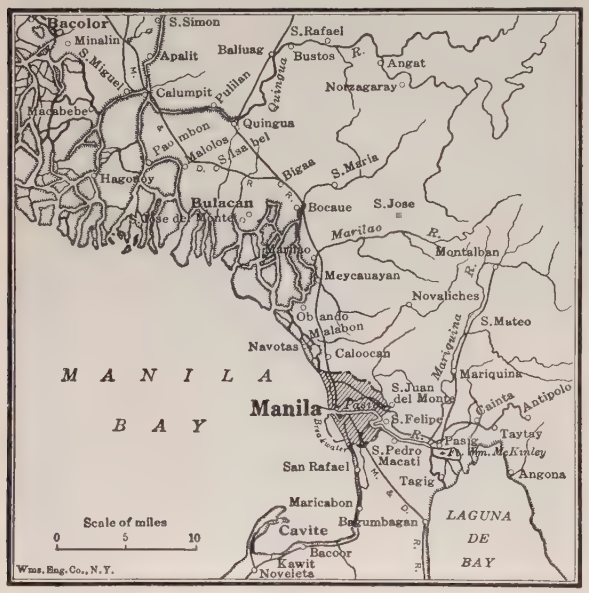


Fig. 451. — Manila and its harbor

Manila spreads out over a low, flat plain on both sides of the Pasig River. It has an excellent harbor, with a breakwater, south of the Pasig, to protect ships from severe storms. Manila carries on a large interisland trade. It is one of the principal ports of the Orient, the chief exports being hemp, sugar, and copra.

undertaken so suddenly on so large a scale. One of our first acts was to bring over from the United States 1,000 school-teachers. To the efforts of our government to promote education the Filipino people have from the beginning responded with enthusiasm. By 1920 more than 12,000 natives had been trained to teach, and more than 600,000 children were enrolled in the schools. This is nearly one half as many as there would be among an equal number of our own people. At the same time modern farm machinery was imported, and attention was given to proper care of the forests.

In the second place, we set to work to unify the inhabitants, *i.e.* to make one people of them. Everywhere the English language has been taught, so that they may have a common speech. Many roads have been built, so that they may meet and understand one another. This latter was a difficult task, owing especially to the heavy tropical rains. In some sections a twelve-inch rainfall in a single day is not unknown, and more than 100 inches fall each year. Such downpours quickly destroy paved roads and make carefully graded dirt roads useless. There are now more than 1,000 miles of concrete road in the islands; several hundred miles of railroad have been constructed, and many steamship lines have been established connecting the islands with one another.

Unifying the people

Meanwhile, as a third benefit, sanitary measures of many kinds were undertaken, as in the Panama Canal Zone (p. 206), so as to accustom the people to cleanliness and to stamp out disease. Much the same success has been achieved in this respect as in Central America and the West Indies (pp. 203 and 207).

Sanitary measures

As the result of all these measures a great improvement has been effected in the mode of life of the inhabitants.

Reasons for and against the independence of the Filipinos. — Many of the Filipinos have expressed a hope that these islands might be given their independence. Should it be granted to them? On the one hand, it is urged that the white man can never settle permanently on the islands and prosper there because of the climate. It is always hot, the noonday sun never being far from overhead; and the moisture in the air due to the surrounding ocean makes the heat especially oppressive.

Arguments for independence

The year is divided into a dry and a rainy season, the former coming in our winter months, the latter in the summer. The dry period lasts while the winds blow from the northeast, though even then the eastern slopes of the islands receive considerable rain; the rainy season comes when they change to the southeast. Then the winds are so damp that there is a deluge of rain which turns much of the country into a swamp. That is why the houses of the native Filipinos are raised from the ground on bamboo stilts, as in Fig. 452. Diseases are most common during the rainy season, and travel is almost impossible, for the roads become rivers of mud.

Such a climate explains why the natives themselves have little energy or ambition; and for the white man, who is accustomed to the invigorating effects of a yearly change of seasons from summer to winter, the tropical climate is much more harmful. The American officials and teachers who work in the lowlands, where most of the natives live, often retire in the summer to the mountains, where the temperatures are somewhat lower. Many of our soldiers who have been stationed for only a year or two in the Philippines return home with their health seriously undermined from the exhausting climate. As the Philippine industries increase, more and more educated people will be required on the islands; but they must come from among the natives rather than from the white race. The natives have borne the bulk of the expense of their education, have made remarkable progress in the short time since they have come under our control, and have shown good capacity for self-government.

Fig. 452. — A native hut in the Philippines

This view of a hut in a bamboo grove shows the common type of house in the Philippines. It is built on stilts to keep it out of the water during the rainy season when the streams overflow. The sides and roof of these houses are made from the woven leaves of the nipa palm. The square opening in the side of the house has sliding shutters and serves as a window. These huts do not have glass windows.

On the other hand, it is urged that our control should continue for many years, if not permanently. The islands have already been a great expense to us, and as one of the leading industrial nations of the earth we need colonies for obtaining raw materials and marketing manufactured goods. Nor are our reasons for retaining control of the islands entirely

Arguments against independence

PHILIPPINE ISLANDS
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 25 50 100 150 200
Capitals of countries
Railroads
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
HAWAIIAN ISLANDS
Scale of statute miles
0 25 50 100
HONOLULU AND PEARL HARBOR
Scale of statute miles
0 5 10
Longitude East from Greenwich
PACIFIC OCEAN
SOUTH CHINA SEA
SULU SEA
CELEBES SEA
LUZON ISLAND
MINDANAO ISLAND
Manila
Cebu
Iloilo
Davao
Zamboanga
Puerto Princesa
Honolulu
Hilo
WILLIAMS ENGRAVING CO., N.Y.

Fig. 453

Questions on Fig. 453. — 1. How many of the Philippine Islands are more than fifty miles long? 2. Which of these islands contain the highest mountains? What effect would you expect this to have upon their rainfall? 3. Would you expect these islands to contain many good harbors? Why? 4. Which island of the group would you expect to afford the most tropical scenery? Which the most varied scenery? 5. Answer the same questions with respect to the Hawaiian Islands.

---

selfish: the Filipinos are far from ready for self-government. Steady habits of work are necessary to that end. When we first undertook to educate them, education meant to them a means of escaping work. They had not been industrious before; and in the short period that we have governed them, they have made only a partial advance toward industry and self-reliance. If we were to leave them to their fate, they would rapidly drop back and would be likely to soon fall under the control of some other nation. What other nation in the Far East would be likely to seek control of the Philippines if we should abandon them?

Facts to be especially well fixed. — 1. The nations in control of this region. 2. The climate. 3. The chief products. 4. The importance of Singapore. 5. Location of the Philippines with reference to direction and distance from China, Japan, Australia, and Hawaiian Islands. 6. Names and location of the two principal islands in the Philippines. 7. Location of Manila. 8. The farm products of the Philippines.

Problems for independent study. — 1. Write a composition describing some of the interesting experiences you would expect to have if you lived in Singapore. Carpenter, F. G.: *Asia*, pp. 237–245 (American Book); Redway, G. W.: *All Around Asia*, pp. 210–211; Encyclopædia Britannica, vol. XXV, p. 147; World Book, vol. 7, p. 5390; Herbertson, A. J.: *Asia*, pp. 205–206 (Macmillan). 2. What objections would you have to living there? 3. Would you expect considerable commerce to exist between Singapore and the Philippine Islands? 4. Make a list of the transportation routes, studied so far, that are controlled by the British. 5. Singapore and the neighboring district are called "The Straits Settlement." Why? 6. Find reasons for the astonishing population and development of Java. Carpenter, F. G.: *Australia*, pp. 228–248; Smith, J. R.: *Commerce and Industry*, pp. 473, 520–521; Gibson, J. C.: *Wealth of the World's Waste Places*, Chapter XXXII; Chamberlain, J. F., and Chamberlain, A. H.: *Oceania*, rev. ed., pp. 106–114 (Macmillan). 7. The East Indies belong chiefly to Holland. Find how they were obtained, and what benefit they have been to that country. Gibson, J. C.: *Wealth of the World's Waste Places*, Chapters XXXII,

Fig. 454. — The Magellan monument at Manila

This statue, commemorating the landing of Magellan, is on the south bank of the Pasig River. Who was Magellan? Consult your textbook in history to see what happened to him in these islands.

XXXIII; Encyclopædia Britannica, vol. XVII, p. 469. 8. Which region in all this area would seem to you to have most attraction as a home for Americans? 9. Make a collection of bamboo, rattan, and Manila hemp. 10. Compare the products of the Philippine Islands with those of the Hawaiian Islands and the West Indies (pp. 174 and 201). 11. Do you consider the Philippine Islands or the Hawaiian Islands the more valuable dependency? Why? Winslow, I. O.: *Our American Neighbors*, pp. 92–111 (Heath); Chamberlain, J. F., and Chamberlain, A. H.: *Oceania*, rev. ed., Chapters XV and XIX. 12. Make a list of our outlying possessions, giving the area, population, and principal products of each. 13. Find out the principal exports to these possessions.

PART VI. AUSTRALIA, NEW ZEALAND, AND THE ISLANDS OF THE PACIFIC

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Australia	British dominion	2,975,540	5,905,000	Sydney	1,012,000
New Zealand	British dominion	105,000	1,382,000	Auckland	181,000
Bismarck Archipelago	Australian mandate	16,000	176,000		
Solomon Islands:					
British	British protectorate	11,000	151,000		
Remainder	Australian mandate	3,800	49,000		
New Guinea:					
Western part	Dutch colony	160,700	195,000		
Northeastern part	Australian mandate	68,500	350,000		
Southeastern part	Australian territory	90,500	276,000		
Western Samoa	New Zealand mandate	1,200	38,000		

Comparisons between Australia and the United States. — Australia, though often thought of as merely a remote island in the Pacific, is so large as to be numbered among the continents. Compare it with the United States in breadth; also in area. How does the latitude of Australia compare with that of our country? What does its latitude suggest to you about its climate?

In Fig. 460 note the section containing most of the population. Do you see any resemblance to the United States in the distribution of its inhabitants? The total population, however, is small. Compare it with that of New York City.

In settling Australia, Europeans found many of the same conditions that early settlers found in our own country. The native population was small and usually peaceful. The first important settlements were made along the well-watered eastern coast (Fig. 459), where the farmers gradually pushed westward toward the mountain ranges (Fig. 455). What is the rainfall on the eastern slope of the continent? In this section, as in our Northeastern States, truck gardening, fruit growing, and dairying have become important industries.

Little by little the sections just beyond the mountains were occupied, until important discoveries of gold led to further exploration. Many unsuccessful miners became farmers and soon wheat and cattle were being raised on the western slopes of the mountains, and farther inland sheep ranges were established. Compare this movement into the interior, and its causes, with the western movement in the United States.

Thus we see that in Australia there have been frontier conditions similar to those in our own country. It is not surprising, therefore, to find that the people are like our own — ambitious, energetic, and progressive. English is the language of the

---

Questions on Fig. 455. — 1. Is Australia chiefly a highland or a lowland continent? 2. Considering its elevation and its latitude, would you expect a great variety of temperatures? 3. Explain the areas of greatest rainfall as shown in Fig. 459, by the prevailing winds and the arrangement of highlands and lowlands. 4. How do you suppose the first human inhabitants reached Tasmania? The Fiji Islands?

AUSTRALIA AND NEW ZEALAND
PHYSICAL MAP
Scale of statute miles
0 100 200 400 600 800 1000
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
DEPTHS IN FEET
Sea level to 600
Below 600
Longitude East from Greenwich
INDIAN OCEAN
PACIFIC OCEAN
AUSTRALIA
NEW ZEALAND
EAST INDIES
Equator
Tropic of Capricorn
SOUTH CHINA SEA
CELEBES SEA
ARAFURA SEA
CORAL SEA
TIMOR SEA
Great Sandy Desert
Great Victoria Desert
Great Australian Bight
NULLABAR PLAIN
Gulf of Carpentaria
Lake Eyre
L. Gregory
L. Torrens
L. Frome
L. Gairdner
L. Austin
Murray R.
Darling R.
Cooper R.
Diamantina R.
Flinders R.
Fitzroy R.
Ashburton R.
Gascoyne R.
Murchison R.
Sharks Bay
Geographe Bay
C. Leeuwin
Northwest C.
Spencer Gulf
Encounter Bay
Kangaroo I.
Bass Strait
TASMANIA
King I.
Furneaux Is.
C. Howe
Mt. Kosciusko 7308 ft.
Mt. Bogong 6508 ft.
Australian Alps
Lachlan R.
Murrumbidgee R.
Great Dividing Range
Macdonnell Range
Musgrave Range
Darling Range
Great Barrier Reef
C. York
Cape York Pen.
Wellesley Is.
Melville I.
Gulf of Papua
Torres Strait
South C.
Louisiade Archipelago
Santa Cruz Islands
Solomon Islands
Bougainville I.
Choiseul
Isabel I.
New Britain I.
New Ireland I.
Bismarck Archipelago
Admiralty Is.
Gilbert Islands
Schouten Is.
Geelvink Bay
Mt. Carstensz 16,964 ft.
Mt. Wilhelmina 15,580 ft.
New Guinea
Aru Is.
Prince Frederick Henry I.
Timor Laut
Banda Sea
Ceram
Buru I.
Celebes
Moluccas
Molukka Passage
Strait of Makassar
Malay Peninsula
Banka I.
Billiton I.
Sumatra
Sunda Strait
Java Sea
Mt. Sumeru 12,060 ft.
Bali
Strait of Lombok
Sunda Sea
Timor Sea
Flores Sea
Lombok I.
Sumbawa I.
Sumba I.
Flores I.
Timor I.
Sunda Islands
Mt. Albert Edward 13,330 ft.
Mt. Sea View 5000 ft.
Lord Howe I.
Norfolk I.
New Caledonia
Loyalty Is.
Erromanga
Mallicollo I.
Espiritu Santo I.
New Hebrides
Vanua Levu
Viti Levu
Kandavu
Fiji Islands
North C.
Bay of Plenty
East C.
North Island
C. Egmont
New Zealand
South Island
Cook Strait
Mt. Cook 12,349 ft.
South C.
Stewart I.
Chatham Islands
424
Williams Engraving Co., N.Y.

Fig. 455

AUSTRALIA AND NEW ZEALAND
POLITICAL MAP
Scale of statute miles
0 100 200 400 600 800 1000
Principal capitals ☆ ⊙ Other capitals
Railroads
WILLIAMS ENGRAVING CO., N.Y.
SOUTH CHINA SEA
CELEBES SEA
BORNEO
SUMATRA
JAVA SEA
CELEBES
BANDA SEA
DUTCH EAST INDIES
NEW GUINEA
TERRITORY OF PAPUA
ARAFURA SEA
TIMOR SEA
TIMOR LAUT IS.
ARU IS.
TIMOR I.
SUNDA ISLANDS
INDIAN OCEAN
Equator
GILBERT ISLANDS (Br.)
NAURU I. (Br.)
ADMIRALTY IS.
BISMARCK ARCHIPELAGO (To Australia)
NEW IRELAND I.
NEW BRITAIN I.
SOLOMON ISLANDS (British)
BOUGAINVILLE I.
CHOISEUL I.
ISABEL I.
MALAITA I.
GUADALCANAL I.
SAN CRISTOVAL I.
SANTA CRUZ IS. (Br.)
LOUISIADE ARCHIPELAGO
CORAL SEA
PACIFIC OCEAN
NEW HEBRIDES (Fr. and Br.)
FIJI ISLANDS (British)
ROTUMA I. (To Fiji)
CHESTERFIELD IS. (Br.)
NEW CALEDONIA (Fr.)
LOYALTY IS. (Fr.)
NORFOLK I. (To Australia)
LORD HOWE I. (To New South Wales)
CHRISTMAS I. (Br.)
GREAT BARRIER REEF
NORTHERN TERRITORY
WESTERN AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
SOUTH AUSTRALIA
VICTORIA
TASMANIA
Great Sandy Desert
Great Victoria Desert
Great Australian Bight
MACDONNELL RANGE
MASCOY RANGE
AUSTRALIAN ALPS
Tropic of Capricorn
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND
Cook Strait
CHATHAM IS. (To New Zealand)
STEWART I.
Longitude East from Greenwich

Fig. 456

country, since it is a part of the British Empire. Like Canada, it is a self-governing dominion.

Lying so far from the great nations of the world, this island continent might be expected to be of little importance to other

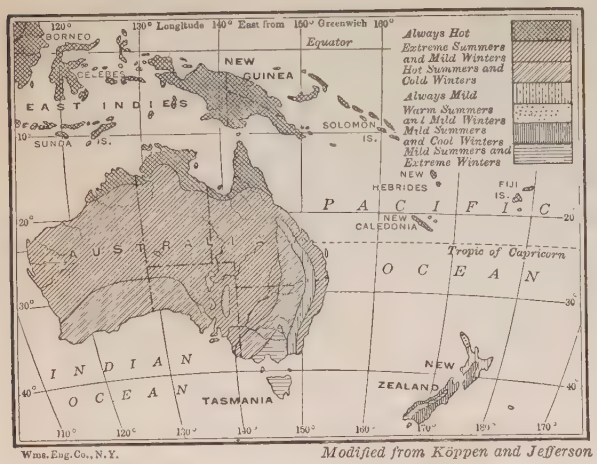


Fig. 457. — The temperature regions of Australia and New Zealand

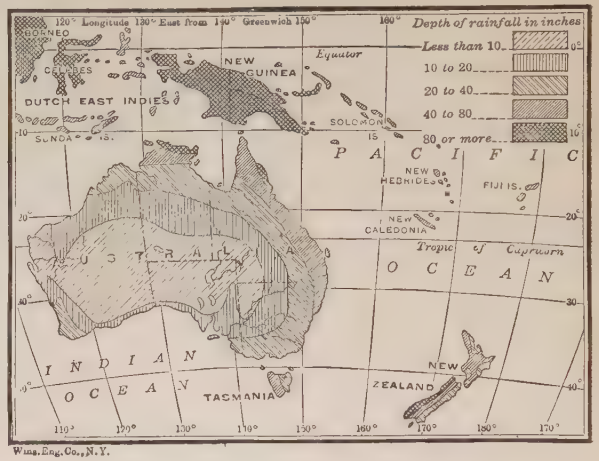


Fig. 459. — Annual rainfall in Australia and New Zealand

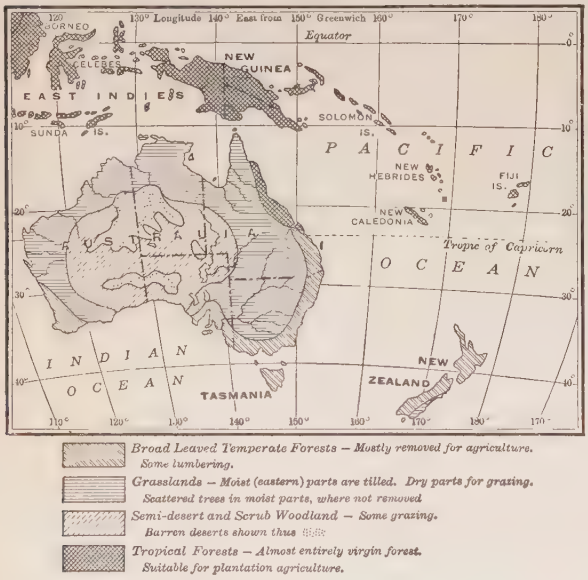

Longitude East from Greenwich
Equator
BORNEO
CELEBES
NEW GUINEA
EAST INDIES
SUNDA IS.
SOLOMON IS.
NEW HEBRIDES
FIJI IS.
NEW CALEDONIA
Tropic of Capricorn
AUSTRALIA
PACIFIC OCEAN
INDIAN OCEAN
TASMANIA
NEW ZEALAND
Broad Leaved Temperate Forests — Mostly removed for agriculture. Some lumbering.
Grasslands — Moist (eastern) parts are tilled. Dry parts for grazing. Scattered trees in moist parts, where not removed
Semi-desert and Scrub Woodland — Some grazing. Barren deserts shown thus
Tropical Forests — Almost entirely virgin forest. Suitable for plantation agriculture.

Fig. 458. — The plant regions of Australia and New Zealand

Fig. 460. — Distribution of population in Australia and New Zealand

How this continent is important to the rest of the world. — On Fig. 495 estimate the distances from Sydney, the principal seaport of Australia, to San Francisco and to London. Is it shorter to London by way of the Panama or the Suez Canal?

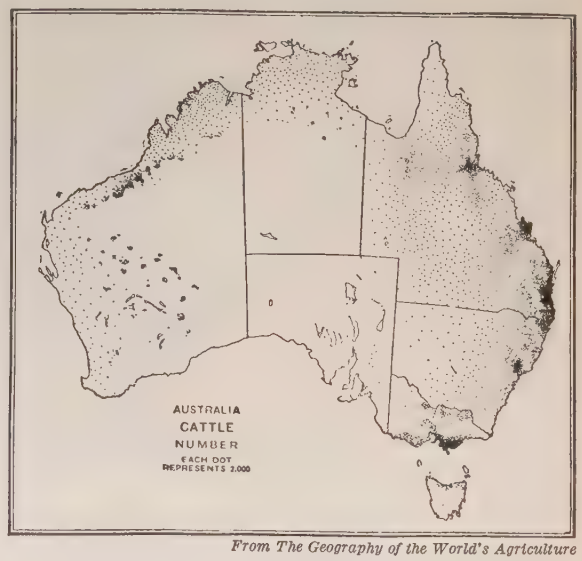
countries. But this is far from the truth. Although Australia has been occupied by civilized people for only a few decades and has a little larger population than New York City, it leads the world in the production of wool and mutton (Fig. 463), and is an important source of wheat supply for England (Fig. 461). Cattle are numerous, and leather, beef (Fig. 462), butter, and cheese are

exported. Many minerals have been found, including gold and coal.

Thus we find that Australia has many natural resources and is, therefore, in a position to enjoy a large trade. The island is of particular value to Great Britain because it is one of her dominions which, at present, has a large surplus of the kinds of articles most needed by the British. What Australian products does Great Britain most need?

From The Geography of the World's Agriculture

Fig. 461



From The Geography of the World's Agriculture

Fig. 462

Why Australia has not made faster progress. — We have already seen that the population of Australia is exceedingly small, although the colonization of the island began over 125 years ago. Let us study the factors which have retarded its settlement.

Lack of rain over a large part of the island is the main reason for its slow development. Fig. 459 shows the distribution of rainfall. Can you explain the small amount of rain in the interior after studying Fig. 455? Estimate the proportion of the entire continent which has less than twenty inches per year. Compare this map with Figs. 461 and 463, to explain the distribution of wheat and of sheep.

Effects of the slight rainfall

Sheep seem to thrive best in a semi-arid region. There are large areas of excellent grassland in east central Australia. Unfortunately, however, this region is subject to great irregularities in rainfall and severe droughts sometimes occur. There were twelve such droughts between 1880 and 1920; during the five-year drought which ended in 1903 it is estimated that 60,000,000 sheep and 4,000,000 cattle perished from lack of food and water. The production of wheat was also greatly reduced during this period.

This uncertainty in regard to rainfall has tended to keep farmers from settling in the interior. A scientist has estimated that the Australian plain with ten inches of rain will support ten sheep per square mile; with thirteen inches of rain, twenty sheep; and with twenty inches of rain, seventy sheep. Since a comparatively slight variation in

rainfall may mean such a large difference in a man's income, many farmers are unwilling to risk settling in the interior.

As one might expect, in view of the light rainfall, Australia has no long rivers like those of our country. What rivers do you find

From The Geography of the World's Agriculture

Fig. 463

Compare Figs. 461 and 462 with Fig. 459 to determine the rainfall in the chief wheat, cattle, and sheep districts. Compare the rainfall in these areas with that of the portions of North and South America where these products thrive.

(Fig. 455)? While it is true that in times of flood the Murray-Darling River has been navigable for nearly 1,000 miles, it is likely to be reduced to a succession of pools in dry seasons. Consequently there is little water transportation in the country. How has this fact probably hindered development?

Not only have agriculture and transportation been retarded by lack of rainfall, but mining as well. The gold mines at Kalgoorlie lie in a very dry region (Fig. 459). Many wells were dug in the hope of supplying the miners with water for drinking purposes and for use in mining operations, but they produced only salt water. Finally a pipe line was built to bring water from Perth. Estimate the length of this line (Fig. 456). Geologists are of the opinion that other parts of the Australian desert (Fig. 455) have valuable mineral deposits. But they cannot be worked at present on account of lack of water.

Difficulty in securing labor has been another serious problem for the Australians. They are too far away from Europe to attract many laborers from that continent. The native people of the island, called *bushmen*, are not only few in number, but are among the most backward of human beings. Consequently, Englishmen have not been so successful in using them for white man's work as they have been in using the natives of South Africa in the mines and those of India on the plantations.

The difficulty of getting laborers and the effect of this on production

One of the most productive parts of the continent is the tropical region in the north; this is a strip about 100 miles wide, having distinct wet and dry seasons. Because of the difficulty of getting labor, only about a third of its area is now under cultivation. The white people of Australia cannot stand the climate; and they refuse to allow Mongolians to be imported from eastern Asia because they fear their competition. Much available land in the tropical region therefore remains idle.

Possible future development of Australia.—With all these obstacles, what is likely to be the future development of Australia? Let us see which of her resources have thus far received little attention; and which of those already considerably developed can be improved.

About five per cent of the island is forested. Several species of the *eucalyptus*, a kind of

gum tree, thrive in the eastern section. Some of these trees rival the giant redwoods of California in size. The forest growth is dense and varied. Australian woods are harder and stronger than most European hardwoods, and grow more rapidly. The lumbering industry should, therefore, in time support thousands of people.

Prospect for development of new industries

Fig. 464. — Smelters at Zeehan, Tasmania

Zeehan, situated at the foot of the mountains near the western coast of Tasmania, is an important railway town. Its chief industry is the mining of silver-lead ore, which is found in great abundance over an area of more than 160 square miles. Zeehan also has large smelting works.

In the future Australia will probably find the sea an important source of wealth. Although there are few good harbors, the many thousands of miles of seacoast have vast resources in fish and pearl oysters.

Australia will probably do more and more manufacturing as time goes on, because of the great distances to Europe and the United States. At present most of the factories prepare only raw materials for export; but with large amounts of coal in the eastern highlands, and with minerals such as silver, copper, lead, and zinc near at hand, a greater quantity of finished products will be turned out. While it is unlikely that Australia will soon export manufactured goods extensively, she ought to be able to supply most of her own needs, except in iron and steel. There are extensive deposits of iron in New South Wales, but they have been little worked. How will development of manufacturing tend to increase the population?

The greatest opportunities for expansion are in agriculture. The climate varies from the wet tropical in the north to the cool temperate in the south (Figs. 457 and 459), so that a wide variety of plant life is possible. The total area suitable for crops is possibly 600,000,000 acres, only a thirtieth of which is under cultivation at present.

Prospect for further development of agriculture

The extension of irrigation will increase the agricultural output. Among the highlands of Victoria and New South Wales, where the heavy rains furnish abundant moisture, there are many excellent sites for irrigation works. Several important projects are under construction both here and in South Australia. Dry farming is gradually being extended in the interior, and the Australians expect greatly to increase their output of wheat by this means.

With the increase in refrigerator ships it is probable that the eastern and northeastern sections will become an important source of fruit supply for Europe. Does their lati-

tude suggest a reason why fruit from this section will be especially welcome in Europe?

If a means of solving the labor difficulty is found, the wet-season tropical region in the north and northeast will become a great producer of sugar, coffee, rubber, and cotton. Can you name several countries that would be glad to buy these products from Australia?

© *Publishers' Photo Service*

Fig. 465. — A dairy herd on the eastern slopes of the mountains of New South Wales

New South Wales, which has an area nearly twice that of California, because of the scantiness and uncertainty of the rainfall is devoted chiefly to stock raising. Vast areas on the western slopes of the mountains are used for sheep, horse, and cattle grazing, but on the eastern slopes, where the rainfall is heavier, wheat and hay are grown and dairying is carried on.

Importance of improvements in transportation. — Most of these advances are dependent on improvements in transportation. With adequate railroads labor can be more evenly distributed; water and other necessities can be provided for the interior in times of drought; and farm products can be brought to the coast for export.

Much has been done in recent years to improve transportation. In 1900 the several divisions of the continent, together with Tasmania, combined to form the Commonwealth of Australia. Name the provinces (Fig. 456). Since that time there has been greater coöperation among the different sections in many ways, including the building of railways. Until recently most of the roads were short lines that led into the interior and "ended nowhere"; but now Brisbane, Sydney, Melbourne, Adelaide, and Perth are connected by rail. In addition, a transcontinental line is under construction to connect the southern cities with Darwin. Estimate the distance of Darwin from Adelaide. What advantages do you see in the location of the former city?

How New Zealand compares with Australia. — In Fig. 456 locate the islands of New Zealand, which also is a British dominion. Estimate the distance from Australia. How does it compare with the distance from New York to Bermuda?

New Zealand has few of Australia's disadvantages, while it has most of its advantages. Its mountains assure abundant rainfall over the western or windward half of the country, as well as moderate rains in the eastern section. There are few regions in the world where the rainfall is more evenly distributed throughout the year or where droughts are so rare. Unlike that of Australia, the rainfall is so heavy that a slight variation in the amount will not work great

© *Publishers' Photo Service*

Fig. 466. — Brisbane, Australia

Brisbane, the capital of Queensland, is one of the largest cities and one of the chief ports of Australia. It has many fine modern buildings, a school of arts, and a university. Its chief industries are sugar refining and meat preserving. Brisbane has a climate similar to that of Tampa, Florida.

hardships on the farmers. As a result, New Zealand has over 25,000,000 sheep, nearly a third as many as Australia. Compare the total area of New Zealand with the sheep-raising area of Australia (Fig. 463).

In what latitude does New Zealand lie? What advantage over Australia is suggested by this fact? Note the temperature regions (Fig. 457). Though the climate is free from extremes, this is a region of distinct winters; plant diseases and troublesome insects are therefore uncommon.

Another advantage is that a surprisingly small part of New Zealand is incapable of use by man. About one tenth of North Island is mountainous, but even here grazing is possible. About one fifth of South Island is too cold or too rocky for occupation. Compare this with the useless proportion of Australia (Fig. 455).

The natives of New Zealand, called *Maoris*, form a striking contrast to the bushmen of Australia. They are a very progressive, intelligent people and readily adopt the white man's ideas. Numbers of them have positions of responsibility with the government and many others are engaged in business. Many are studying modern agricultural methods with the intention of teaching them to their fellows.

The exports of New Zealand are similar to those of Australia. Wool and hides are most important; meat, dairy products, and

© *Publishers' Photo Service*

467. — A glacier of South Island, New Zealand

The glaciers of South Island, New Zealand, rival those of Switzerland in size and beauty. Great glaciers descend the western slopes of the mountains, in some places reaching within a few hundred feet of the sea. Gold is found under the glacial drift and in the shore sands.

fruit are sent abroad in refrigerator ships; and some lumber and a few minerals are exported. Like Australia, New Zealand lacks iron, but has enough coal so that her possibilities for manufacturing are about the same as those of Australia.

The Pacific Islands. — Fig. 456 shows that the South Pacific Ocean is dotted with many small islands and a considerable number of large ones. There are hundreds of others too small to be shown on the map, many being simply coral reefs rising a few feet out of the sea. For the most part these small islands are of little value except as cable stations. Note those which belong to the United States. A few of the small islands export a little *copra*, the dried meat of the coconut; but most of them are rarely visited by ships; their inhabitants live an easy and lazy life and have little contact with the outside world.

Many of the comparatively small islands, however, like the volcanic, mountainous islands of Fiji and New Caledonia (Fig. 456), are of more importance. There one finds sugar and coffee plantations, as in Hawaii, while tropical fruits, such as bananas and pineapples, are raised in great quantities.

Facts to be especially well fixed. — 1. Location of Sydney; Melbourne; Adelaide. 2. Surface features of Australia; New Zealand. 3. Climate of these regions. 4. Principal products of Australia; of New Zealand.

Problems for independent study. — 1. Is the climate of Australia more or less favorable to agriculture than that of the United States? Carpenter, F. G.: *Australia*, pp. 13, 33, 67 (American Book); Smith, J. R.: *Commerce and Industry*, pp. 495–497 (Henry Holt); National Geographic Magazine, vol. 30, pp. 475–479. 2. If it were within your power, how would you arrange the highlands of Australia so as to secure the most even distribution of rain? National Geographic Magazine, vol. 30, pp. 476–477; Chamberlain, J. F., and Chamberlain, A. H.: *Oceania*, rev. ed., pp. 5–7 (Macmillan).

PART VII. AFRICA

Why Africa was not settled by Europeans before North America. — At the time of the discovery of America, Africa was practically unknown except for a narrow strip along the Mediterranean coast. Most people thought that south of the Mediterranean region lay nothing but desert. They had good reason for this belief. Estimate the width of the Sahara north and south (Figs. 469, 470, and 472). How does its area of about 4,500,000 square miles compare with that of the United States?

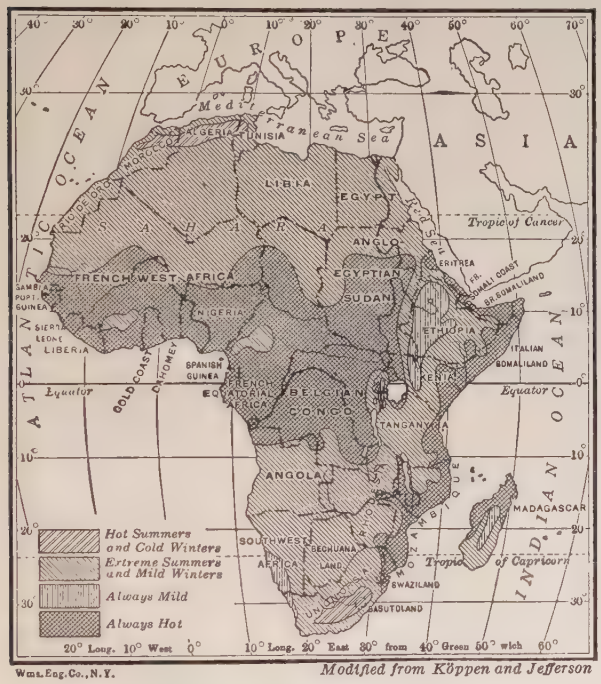


Fig. 468. — The temperature regions of Africa

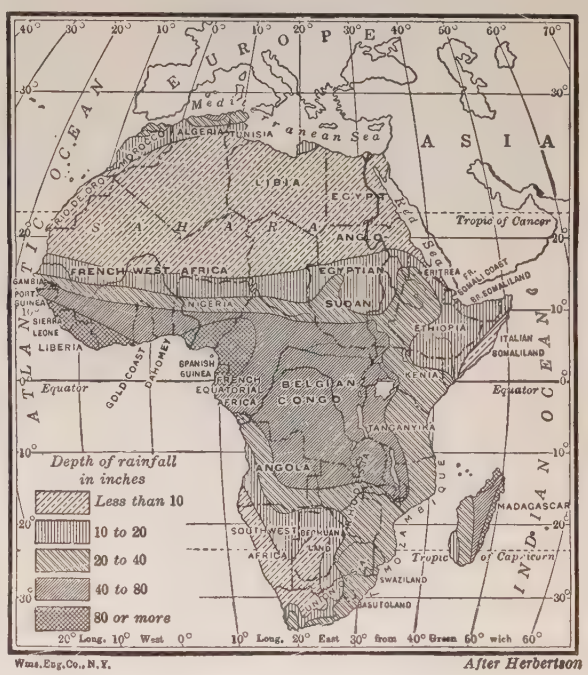


Fig. 469. — Annual rainfall in Africa

Portuguese sailors had ventured along the west coast even as far as the Cape of Good Hope. These sailors, like Columbus, were looking for a new route to India. A few years after the first voyage of Columbus, ships did reach India by way of the Cape of Good Hope. Some time later, trading with the natives was undertaken at many points along the coast. Thus we find that Europeans began to be interested in Africa and America at about the same time.

When earliest explorations were made of each continent

Why, then, did such great numbers of Europeans cross the ocean to America instead of going to the nearer continent? In the first place, the climate of North America, being much like that of Europe, was far better suited to the white man than that of most parts of Africa. Note where the equator crosses Africa and how much of the continent is *always hot* (Fig. 468). How does the latitude of Cairo and of Cape Town compare with that of New Orleans?

Why explorations were not continued

What does this tell you about the climate of the continent as a whole? Over large areas, especially where there is a heavy rainfall, there are tropical diseases which are very deadly to the white man.

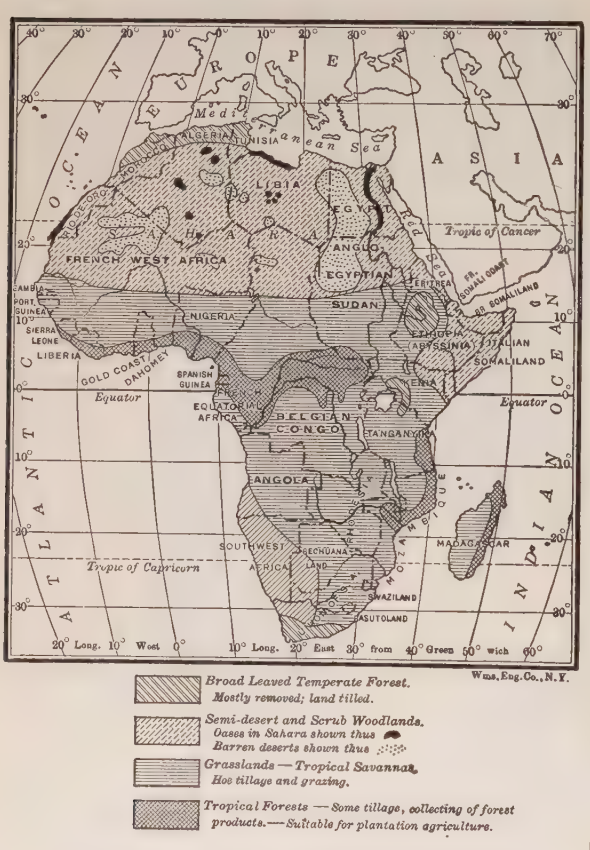


Fig. 470. — The plant regions of Africa

Difficulties of exploration and travel in the interior long prevented Africa's resources from becoming known. Africa differs from most other continents in the lack of great mountain systems. The continent is mainly a plateau, but near the coasts the edges of the table-land are broken and the rocks uplifted in such a way as to form a mountain rim around a large portion of the continent (Fig. 472). There are no broad coastal plains, as in North and South America. Consequently, the rivers are interrupted near the coast by rapids and falls. Explain how this interferes with exploration. How have the rivers of North America favored exploration?

It has, therefore, been practically impossible to develop the interior of Africa without building railroads. The immense area of the continent, however, has discouraged this. Compare its area with that of North America. How far is it from Cape Verde to Cape Guardafui (Fig. 472)? How far is it from Cairo to Cape Town? Long railroads across deserts and jungles are expensive to build and operate, and only recently have many been built in Africa. Note the number of short lines running from the coast a little way into the interior.

As a result of such conditions, which have discouraged the settlement and development of the continent, there are very few Europeans in Africa. In the Belgian Congo, the population is estimated at about 8,513,000, yet there are only about 13,000 whites. In French West Africa, the total white population numbers only about 8,500, while the native negro population is more than 12,650,000. Only in the southernmost part of Africa are white people numerous. Most of the continent south of the Sahara is a land of dark peoples. What is the total population of the continent? How does it compare with that of North America (p. 477)?

The proportion of Europeans in Africa

Why Europeans are now interested in this region. — During the last sixty or seventy years the nations of Europe have spent large sums of money in exploring Africa and have been very active in acquiring territory there. What has caused this new interest?

In the first place, from the discoveries

already made, they know that Africa is a valuable source of raw materials. It has a large area suitable for agriculture, and great mineral wealth. It already yields each year more gold than the United States (p. 457);

Fig. 471. — The distribution of population in Africa

Each dot represents 100,000 people.

it supplies nearly all the world's diamonds; and it is producing more and more copper.

Secondly, when properly educated to the use of the white man's goods, the immense population there will form a great market for European manufactures. Even at the present time British exports to British African possessions have an annual value of about $350,000,000.

Lastly, there is the hope that colonies can be developed in some portions of Africa to which the surplus population of the European nations may go and still remain under the home governments.

How they have divided the continent among them. — The European powers have paid little attention to the wishes of the natives in acquiring control of Africa. After about 1850 they began to extend the number of settlements at various points along the coast. These became centers for exploration and trade, and the regions in which the various nations operated came to be known as *spheres of influence.* These were gradually extended until the whole continent, except Ethiopia (Abyssinia) and Liberia, became more or less under the control of various European nations.

The British spread northward from Cape Town, as well as southward from the mouth of the Nile, and also acquired large areas in both East and West Africa. The French advanced from Algeria, which they had conquered and occupied in 1830, and from the coastal strip of Senegal, the most western

Questions on Fig. 472. — 1. Compare the largest lake in Africa in size with Lake Superior (Fig. 1). 2. Compare Africa with the other continents in regularity of coast line. What effect would you expect the difference that you observe to have upon commerce with Africa? 3. Compare this map with Fig. 469 to explain the lack of important rivers in the northwestern section; the many branches of the Congo, Zambezi, and upper Nile. 4. Compare the width of the continental shelf, or the area of shallow water surrounding the continent, with that of the shallow water off the coasts of the other continents.

AFRICA
PHYSICAL MAP
Scale of statute miles
0 250 500 1000 1500
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
Sea level to 1000
Below sea level
DEPTHS IN FEET
Sea level to 600
Below 600
EUROPE
ASIA
ATLANTIC OCEAN
INDIAN OCEAN
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
RED SEA
Bay of Biscay
Strait of Gibraltar
Gulf of Gabes
Gulf of Sidra
Nile Delta
Suez Canal
Persian Gulf
Gulf of Aden
Bab el Mandeb
Tropic of Cancer
Tropic of Capricorn
Equator
AZORES ISLANDS
MADEIRA ISLANDS
CANARY ISLANDS
C. Bojador
C. Blanco
C. Verde
BISSAGOS ISLANDS
ASCENSION I.
ST. HELENA I.
Wady Draa
Atlas Mts.
Oasis of Wargla
Oasis of Siwa
Oases of Fezzan
Oases of Kufra
Libyan Desert
Nubian Desert
Igid Desert
Sei Juf Desert
AHAGGAR PLATEAU
HIGHLANDS OF TIBESTI
BARKA PLATEAU
Mt. Sinai
SINAI PEN.
First Cataract
Second Cataract
Third Cataract
Fourth Cataract
Fifth Cataract
Sixth Cataract
Lake Chad
Bahr el Ghazal
Shari R.
Senegal R.
Gambia R.
Niger R.
Nyger R.
Benue R.
WEST SUDAN HIGHLANDS
Bight of Benin
CAMEROON HIGHLANDS
C. Palmas
GULF OF GUINEA
FERNANDO PO
PRINCES I.
ST. THOMAS I.
C. Lopez
ANNOBON I.
CONGO BASIN
L. Leopold II
Albert Nyanza
Albert Edward Nyanza
Stanley Falls
Stanley Pool
Kasai R.
Congo R.
Kwango R.
Ubangi R.
Uele R.
Semliki R.
Lake Rudolf
Blue Nile R.
White Nile R.
Atbara R.
Sobat R.
Juba R.
PLATEAU OF ABYSSINIA
Lake Tana
UGANDA HIGHLANDS
Ruwenzori Mts. 16,619 ft.
Mt. Elgon 14,094 ft.
Victoria Nyanza
Mt. Kenia 18,370 ft.
Mt. Kilimanjaro 19,710 ft.
Lake Tanganyika
L. Moero
L. Bangweolo
Lake Nyasa
KATANGA HIGHLAND
Kuando R.
Zambezi R.
Victoria Falls
Matopo Hills
Limpopo R.
Kalahari Desert
Orange R.
Vaal R.
GREAT KARROO
DRAKENSBERG
C. of Good Hope
C. Agulhas
Delagoa Bay
C. Corrientes
C. Ste. Marie
Mozambique Channel
MADAGASCAR
PEMBA I.
ZANZIBAR I.
MAFIA I.
ALDABRA I.
FARQUHAR ISLANDS
COMORO IS.
C. Amber
STE. MARIE I.
MAURITIUS I.
REUNION I.
SOKOTRA I.
Guardafui
SOMALI PENINSULA
Somali R.
Lake Rudolf
Lake Tana
Victoria Nyanza
Lake Tanganyika
Lake Nyasa
Zambezi R.
Congo R.
Niger R.
Nile R.
Tigris R.
Euphrates R.
Danube R.
Adriatic Sea
Corsica
Sardinia
Balearic Isles
Sicily
Crete
Cyprus
Longitude 20° West 0° 10° Longitude 20° East 30° from 40° Greenwich 50° 60°
WILLIAMS ENGRAVING CO. N.Y.

Fig. 472

AFRICA
POLITICAL MAP
Scale of statute miles
0 250 500 1000 1500
Railroads
Canals
Capitals of independent countries
Capitals of foreign possessions
ATLANTIC OCEAN
INDIAN OCEAN
EUROPE
ASIA
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
RED SEA
Bay of Biscay
Bordeaux
Marseille
Rome
Naples
Constantinople
Tiflis
Baku
Lisbon
Madrid
Gibraltar
Strait of Gibraltar
Tangier
Oran
Algiers
Tunis
Bizerta
Susa
Sfax
Tripoli
Benghazi
Derna
Alexandria
Smyrna
Athens
Aleppo
Damascus
Jerusalem
Baghdad
Teheran
Basra
Persian Gulf
Suez
Cairo
AZORES ISLANDS (Port.)
MADEIRA IS. (Port.)
CANARY IS. (Span.)
Casablanca
Rabat
Fez
Morocco
Mogador
Tafilelt
Ain Sefra
Wargla
Colomb Bechar
Ghadames
Ifni (Sp.)
Wady Dra
RIO DE ORO
Villa Cisneros
C. Blanco
Wadan
Tauderni
Ideles
Tropic of Cancer
Ghat
Murzuk
Oases of Kufra
Siwa Oasis
Libyan Desert
Assiut
Kharga
Aswan
Medina
Mecca
Wady Halfa
Port Sudan
Suakin
Berber
Dongola
Khartum
Omdurman
Sennar
Massaua
Asmara
Aden
Gulf of Aden
Gondar
Tana L.
Djibuti
Berbera
SOKOTRA I. (Br.)
C. Guardafui
Addis Ababa
Harar
ETHIOPIA (ABYSSINIA)
Bari
Obbia
Kodok
Nile R.
Sobat R.
Blue Nile R.
White Nile R.
Lake Rudolf
Bardera
Mogadisho
ITALIAN SOMALILAND
BRITISH SOMALILAND
FRENCH SOMALI COAST
Arawan
FRENCH WEST AFRICA
Agades
NIGER
Timbuktu
FRENCH SUDAN
Kayes
Segu
Bamako
Senegal R.
Niger R.
St. Louis
Dakar
SENEGAL
GAMBIA (Br.)
PORTUGUESE GUINEA
Bolama
Timbo
FRENCH GUINEA
Konakry
SIERRA LEONE (Br.)
Freetown
LIBERIA
Monrovia
C. Palmas
UPPER VOLTA
Kurussa
Sokoto
Kano
Yakoba
Kuka
Lake Chad
Bahr el Ghazal
CHAD
Ft. Lamy
Shari R.
ANGLO-EGYPTIAN SUDAN
Sennar
Kordofan
Gondar
NORTHERN TERRITORIES
Bida
Zungeru (British)
Yola
Benue R.
NIGERIA
Ibadan
Abeokuta
Lagos
Porto Novo
Lome
Akkra
Sekondee
Bingerville
IVORY COAST (Br.)
ASHANTI
Kumassi
GOLD COAST COLONY
TOGOLAND
Ngaumdere
CAMEROON
Yaunde
Buea
FERNANDO PO I. (Sp.)
PRINCES I. (Port.)
SPANISH GUINEA
GULF OF GUINEA
Libreville
Equator
ST. THOMAS I. (Port.)
ANNOBON I. (Sp.)
FRENCH EQUATORIAL AFRICA
Ubangi R.
UBANGI-SHARI
Zemio
Bangui
Mbomu R.
Congo R.
Upoto
Albert Nyanza
Ruwenzori Mts.
UGANDA
L. Rudolf
KENIA
BRITISH EAST AFRICA
Entebbe
Kisumu
Victoria Nyanza
Nairobi
Mt. Kenia
Lamu
Mombasa
PEMBA I.
Zanzibar
Dar-es-Salaam
Mt. Kilimanjaro
TANGANYIKA
Tabora
Stanleyville
Coquilhatville
BELGIAN CONGO
Kindu
Francqville
Brazzaville
Mayumba
Kabinda (Port.)
Leopoldville
Kongolo
Matadi
Boma
Lulauburg
Lake Tanganyika
Mpweto
Loanda
Malanje
L. Moero
Kilwa
ASCENSION I. (Br.)
ALDABRA IS. (Br.)
COMORO IS. (Fr.)
FARQUHAR IS. (Br.)
C. Amber
Bangweolo
Ruvuma R.
Lake Nyasa
Benguela
ANGOLA
Elizabethville
Ft. Jameson
Bihe
Portuguese
Kalukengo R.
NORTHERN RHODESIA
Zambezi R.
Zomba
Mozambique
Blantyre
Sena
Salisbury
Mossamedes
ST. HELENA I. (Br.)
C. Frio
Livingstone
SOUTHERN RHODESIA
Bulawayo
Beira
Tamatave
Tananarive
MAURITIUS I. (Br.)
REUNION I. (Fr.)
MADAGASCAR
Mozambique Channel
Grootfontein
SOUTHWEST AFRICA
Swakopmund
Walvis Bay
Windhuk
BECHUANALAND PROTECTORATE
Kalahari Desert
(To Union of South Africa)
Angra Pequena
Johannesburg
Pretoria
TRANSVAAL
Mafeking
Inhambane
Delagoa Bay
Lourenco Marques
Tropic of Capricorn
C. Ste. Marie
UNION OF SOUTH AFRICA
ORANGE FREE STATE
Kimberley
Port Nolloth
Orange R.
Bloemfontein
Pietermaritzburg
Durban
BASUTO LAND
NATAL
Cape Town
C. of Good Hope
C. Agulhas
East London
Port Elizabeth
Longitude West from Greenwich
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.
1028

Fig. 473

Questions on Fig. 473. — 1. Compare the number of political units in Africa with that in the other continents that you have studied. 2. British possessions are indicated in pink, and French possessions in light purple. About what proportion of the area of Africa do you estimate to be included in each? 3. Point out the African possessions of four other European nations. 4. By comparison with Figs. 469 and 472, compare the probable value of the French possessions with those of the British.

point in Africa, as well as from the French Congo. Somewhat later the Germans secured a foothold on the coast of Cameroon and at several other points. Portugal had long maintained trading posts along the coast, but was most active on the east coast and sent expeditions into the interior from the mouth of the Zambezi River. Italy took possession of two small districts near the entrance to the Red Sea and later also of Libia on the Mediterranean. Locate them.

These spheres of influence were finally extended so far inland that it was feared disputes might arise among the nations establishing them unless some definite boundaries were fixed. A conference was therefore held in Berlin in 1884 and again in 1890, and the *Partition of Africa* was agreed upon. The boundaries then fixed have changed only in minor ways since, except that the German territory since the World War has fallen under British and French control.

With the addition of over 700,000 square miles of African territory that Germany lost as a result of her defeat in the World War, Great Britain now controls slightly more of the continent than France, each holding less than 4,000,000 square miles. Compare this with British territory in North America. Belgium and Portugal each controls nearly a million square miles, and Italy 812,800.

Political Division	Form of Government	Area in Square Miles	Population	Largest City	Population
Egypt	Limited monarchy	383,000	14,055,000	Cairo	791,000
British (territory in) East Africa	British protectorates and mandated territory	688,300	9,961,000		
Northern Rhodesia	British colony	291,000	1,111,000	Livingstone	
Southern Rhodesia	British dominion	149,000	807,000	Salisbury	6,000
Union of South Africa	British dominion	472,400	6,929,000	Johannesburg	288,000
Algeria	French colony	222,200	5,806,000	Algiers	207,000
French Equatorial Africa	French protectorate	982,000	2,846,000	Libreville	4,000
Madagascar	French colony	228,700	3,471,000	Tananarive	69,000
Morocco	French and Spanish protectorates	231,500	6,000,000	Fez	125,000
Tunisia	French protectorate	48,300	2,095,000	Tunis	172,000
Belgian Congo	Belgian colony	909,700	8,513,000		
Libia	Italian colony	580,000	800,000	Tripoli	60,000
Mozambique (Portuguese East Africa)	Portuguese colony	428,100	3,210,000	Mozambique	363,000
Ethiopia (Abyssinia)	Monarchy	350,000	10,000,000	Addis Ababa	66,000
Liberia	Republic	43,000	2,000,000	Monrovia	10,000

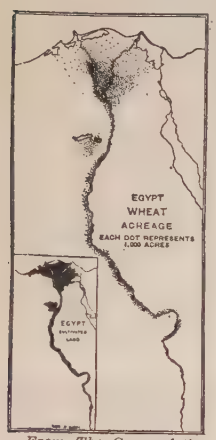
Questions. — 1. How do you account for the blank spaces in the table of "largest cities"? 2. In general, what does this table show regarding the size of African cities? 3. What does it suggest regarding manufacture and transportation? 4. This table includes only the more important countries of Africa; for a list of the others, see p. 480. 5. Compare the area and population of the Union of South Africa with those of the most important British dominions outside Africa.

Great Britain's interest in Egypt. — About 3,000 years before the time of Christ, the Land of the Nile was one of the leading countries of the world. Read Genesis, Chapter XXXVII. For centuries Egypt was misruled as a dependency of Turkey. After the construction of the Suez Canal British influence grew rapidly in Egypt, and in 1914 the British assumed a protectorate over it. This lasted till 1922 when independence was granted and a monarchy established under such conditions that Britain holds a privileged position.

Why Egypt has been of great value to the British

1. Its value for agriculture

a. Its agricultural products



From The Geog. of the World's Agriculture

Fig. 474

One reason for its value to the British was its agricultural products, particularly cotton and wheat. The cotton grown there has a long fiber that is especially prized by textile manufacturers; this is the "long staple" cotton that has recently been transplanted to southern California and Arizona (p. 141). The wheat, also, was shipped in large quantities to Great Britain.

One might think that agriculture would be impossible in Egypt, when one learns that the rainfall is less than one and one half inches per year. In what wind belt is Egypt (Fig. 242)? What are the conditions for rain in this belt (p. 236)? Most of Egypt is a desert. But there are about 12,200 square miles, extending along the banks of the Nile River and including the delta, that make up for the enormous unproductive area. This narrow strip is one of the most fertile regions in the world. Notice in Fig. 471 how large a part of the population is located there.

b. The secret of its productiveness

What is the secret of its productivity? It is the Nile. From Khartum to the Mediterranean that river has very few tributaries, flowing through a desert almost all the way. Estimate the distance. Yet it not only reaches the sea without drying up, but regularly every year it rises until in some places in Egypt it is as much as ten or fifteen miles in width. When the floods subside, not only is much moisture left in the ground, but a layer of fine mud or silt is left upon the land, which is remarkably rich in plant food. These yearly floods, therefore, are the secret of its fertility.

What causes them? One of the sources of the Nile, Victoria Nyanza, lies near the equator in a region where the rainy season lasts about six months; the principal tributaries, moreover, the Blue Nile and the Atbara, come from the rainy Abyssinian Highland. In Fig. 469 note the rainfall in these two regions. These sources of the Nile lie in the equatorial rain belt during the spring; the water which they then receive floods the river valley in Egypt during the summer.

From The Geog. of the World's Agriculture

Fig. 475

In order that more than the flooded area may be cultivated, the water must be lifted to the higher land. Canals or ditches lead off from the river and the water is lifted to the higher level by pumps operated with oxen or by hand.

2. Location of the Suez Canal

The second great reason for the importance of Egypt to Britain was the fact that the Suez Canal is located within its boundaries. Note the name of the town at each end. This, as we saw on p. 393, is a part of the water route by

way of the Mediterranean between England and India. How would you expect this fact to affect the extent of trade with Egypt?

© *Publishers' Photo Service*

Fig. 476. — Scene along the upper Nile

Although the valley of the upper Nile is narrow, it is so fertile that it produces most of the sugar cane and cotton grown in Egypt. The villages along the banks usually have groves of date palms around them. Figs, olives, and pomegranates are some of the exports.

In some years the rainfall at the sources of the Nile is not as heavy as in other years. Then there is a scarcity of water in the Nile Valley 1,500 miles to the north, and famine may result. The "seven lean years" mentioned in the story of Joseph were no doubt a period of such scarcity of water.

What the British have done to make Egypt more valuable

1. Their plans for conservation of water

Yet even at such times the greater portion of the flood waters is carried on to the Mediterranean without being used in any way upon the land. If these waters could be held in some way and used as wanted, not only might the danger of famine be overcome, but additional land might be watered. When the British began to take an interest in Egypt, they saw the importance of measures of this kind and built several great dams across the Nile. One of the largest in the world is at Aswan (Fig. 473), which stores up enough water to irrigate a third of the cultivated land of Egypt. With British aid other dams will be built across the upper portions of the Blue Nile and Atbara rivers, which will probably result in preventing famines altogether.

2. Their better methods of agriculture

By introducing modern methods of using the water, the British also made possible three growing seasons per year. How do the temperature conditions permit this? In what temperature belts is Egypt? Cereals are sown in November and harvested in May or June. The summer crops, sown in March and harvested in October and November, are rice, cotton, and sugar. The fall crops, sown in midsummer and harvested in September and October, are corn, rice, and vegetables. Cotton (Fig. 475) is probably the most valuable crop at present, the annual output being about 1,200,000 bales. What percentage is this of the world's supply (p. 101)?

The British caused great changes in the methods of farming, many of which were at least 2,000 years old. More than half the inhabitants are engaged in agriculture, most of the farmers being peasants of little or no education, although they are intelligent and learn quickly. The improvement of the condition of this class has

been one of the biggest problems in the development of Egypt. But the fact that the average yield of cotton per acre is now twice what it is in the United States and four times that in India suggests that progress has been made.

3. Their provision for transportation

Since the Nile cannot be navigated throughout its length on account of falls and rapids (Fig. 472), a railroad was constructed by the British along its course. Trace this railroad from Alexandria to Khartum. How does the position of Cairo at the point where the fertile Nile Valley ends and where the equally fertile delta region begins explain the fact that it is the largest city in Africa?

© *Publishers' Photo Service*

Fig. 477. — A sugar-cane market in Cairo

The sugar-cane market occupies only a small portion of the big produce market, which is opposite the Sultan Hasan Mosque, the most famous of the 500 mosques in the city. Boats bring the cane to this market from the sugar fields that border the Nile.

© *Publishers' Photo Service*

Fig. 478. — A caravan entering Cairo

Some of the caravans which come from the desert into Cairo include as many as 1,000 camels. From Fig. 473 determine from what direction this caravan probably came.

It is evident that the British helped Egypt in many ways. Their efforts very greatly increased the prosperity of the country. Yet the people were not satisfied (p. 294); and when they demanded independence, it was granted them, but with a few important conditions. One of these will leave the Suez Canal under the control of the British, with the right to maintain troops for its protection. The special rights of the British in the Nile Valley must also be recognized, since the improvements made by them there represent an enormous investment.

Changed relationship between the countries

© Underwood and Underwood

Fig. 479. — Carrying ivory to an African seaport from the interior

Mombasa, the chief seaport of British East Africa, carries on an important export trade in ivory (elephant tusks). Elephants in large herds abound in the tropical regions of Africa; their tusks are larger and heavier than those of Asiatic elephants, but the elephant is not a domestic animal here as it is in India.

Parts ruled or influenced by the British. — British East Africa, which includes Kenia Colony, Uganda, Zanzibar, and what was formerly German East Africa, is likely to become one of the most valuable portions of the continent. An important factor in the development of the country is that, although this section lies near the equator, the climate of a large part of it is, on account of its altitude, suitable for the white man. Even on the coastal lowlands, where it is very hot, the white man can supervise the work of the natives because he can rest in the higher lands to the west. The soil proves very productive under modern farming methods, and there is a large variety of crops.

The promise of equatorial East Africa

Northern and Southern Rhodesia form a third district of great importance. Between what parallels of latitude does it lie? Its climate is not so disagreeable as its latitude suggests. In what temperature belt is it? Estimate the area above 2,000 feet (Fig. 472). In the uplands the climate is admirable; in fact, it would be difficult to find a more suitable place for European colonization in any part of the world not yet occupied by white men.

Advantages offered by Northern and Southern Rhodesia

The natural vegetation is chiefly grass, with scattered trees and groves, typical of

© Publishers' Photo Service

Fig. 480. — Victoria Falls, Rhodesia

The Zambezi River as it flows over a cliff one mile wide and 400 feet deep forms the largest waterfalls in the world. The rocks at the brink divide the falls into four main cataracts, the largest of which is Rainbow Fall. Columns of cloudlike spray rise above the falls to a distance of 1,000 to 3,000 feet and are visible on a clear day ten miles or more away, and the roar of the tumbling waters can be heard a distance of twenty or thirty miles.

savannas. What industry does this suggest? Sheep, goats, and cattle thrive on the uplands, but before they can prosper on the lowlands some means must be found for destroying the insects which there torment them.

A wide variety of crops can be raised, varying from those of warm temperate to those of tropical climates. Can you explain this? It is the desire of the British to increase the production of cotton in an attempt to make England independent of America for its supply of raw cotton. Compare the distance from Salisbury to Manchester, England, by way of Cape Town, with that from Galveston to Manchester. Do you think it likely that Rhodesian cotton can ever be a serious competitor of ours?

In mineral resources there are great opportunities for development. There are large deposits of gold, besides silver, lead, zinc, copper, asbestos, diamonds, coal, and iron.

© *Publishers' Photo Service*

Fig. 481. — Gold mining near Johannesburg

The Rand, the low, rounded range of hills shown in the picture, is famous for its gold. Some of the veins of gold are said to be sixty-one miles long and many feet deep. Johannesburg, which is in the Rand region, is now the largest gold-mining center of the world.

The Rhodesian Railroad system already has nearly 2,500 miles of lines and is connected with the South African system and the east coast of Africa. Estimate the distance by rail from Salisbury to Cape Town; also to Beira. What other outlets to the sea are there for this district?

Rich deposits of diamonds and gold have been the chief reason for the prominence of South Africa. Diamonds were discovered about 1870 in the vicinity of Kimberley; nearly a billion dollars' worth have been taken from South African mines since that date. Over ninety-eight per cent of the world's supply of diamonds comes from this region. They are most often found in the "pipes" of old volcanoes or in the debris washed from them by water.

The Union of South Africa

1. Why South Africa has been the most profitable British territory in Africa

More than two and a quarter times as much gold has been taken from South Africa since 1884 as has been produced in the United States since the discovery of gold in California in 1849. Johannesburg, the largest city in South Africa, is the center of this industry.

Europeans lived in South Africa 300 years before the discovery of diamonds and gold. From its location and altitude (Fig. 473) can you suggest some of the first attractions? Agriculture and manufacturing have been increasing in im-

2. Its promise for the future

© Publishers' Photo Service

Fig. 482. — Cooking in the compounds at the diamond mines, Kimberley

Most of the diamond diggers are native negroes. They live in *compounds*, or camps inclosed by high fences. Can you suggest why? The Kimberley mines supply ninety-eight per cent of the world's supply of diamonds.

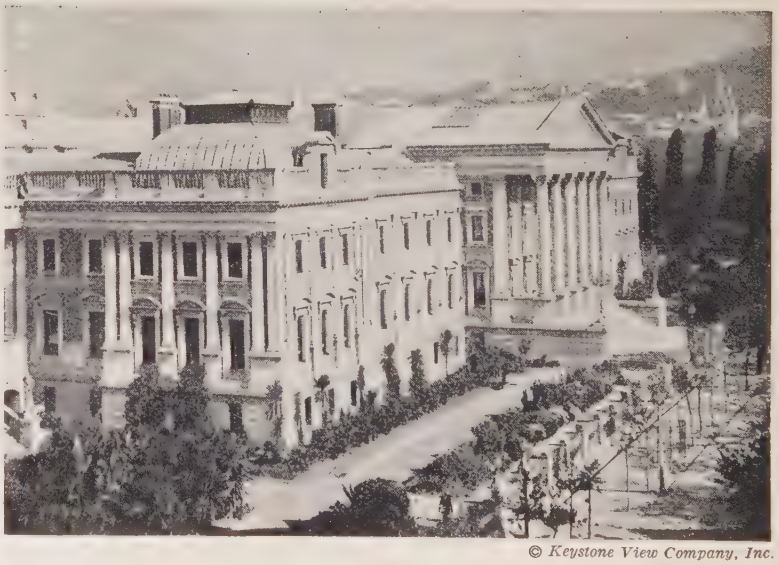
portance each year; it is very probable that this region would eventually have become important without the discovery of diamonds and gold. In 1919 the value of agricultural and manufactured products equaled that of the mineral products.

a. Its agricultural products

Fruit growing is important. Fruit is ready for European markets at the time when it is most in demand there. Why? Strawberries, peaches, lemons, oranges, nectarines, apricots, apples, and pears, as well as garden truck, are shipped north in refrigerator ships. Compare the type of vegetation about Cape Town with that along the Mediterranean (Fig. 293).

Herding has long been an important industry on the grassy plains of the interior plateau. There are many millions of cattle and sheep in the Union, as well as ostriches and goats. Butter, cheese, meat, wool, and leather are being produced in large enough quantities to be exported.

Corn, wheat, oats, and barley grow well in this region. Tobacco is one of the most important agricultural products, but there is a tendency to replace it with cotton, which does not suffer so much from



© Keystone View Company, Inc.

Fig. 483. — The Parliament buildings, Cape Town

Cape Town is a very modern city in appearance, having broad streets, a beautiful botanical garden of fourteen acres, electric cars, and fine buildings, of which the Parliament buildings are most important. Cape Town is situated at the foot of Table Mountain, a slope of which is shown in the background of the picture, and at the head of Table Bay, which opens into the Atlantic Ocean.

the numerous droughts. Cotton from South Africa sells in England for slightly more per pound than the same kind from America, on account of its longer fiber. The production of sugar cane has made rapid progress of late and now nearly supplies the local demand. From Figs. 468 and 469, what reasons can you suggest for the wide variety of products in this region?

b. Possibilities of manufacturing

Manufacturing is rapidly increasing. Leather and tobacco products are the leading manufactures, while some advance has been made in the production of dried fruit and jams. Discoveries of rich deposits of iron and coal have led recently to the building of blast furnaces. The coal is of excellent quality and easy to mine. The supply of iron ore is said to be practically unlimited. How will these discoveries benefit the region about Johannesburg if the supply of gold gives out, as some believe it will in the near future?

c. Provision for transportation

The rivers are of little use for navigation. Can you suggest why? But there is a network of railroads totaling over 11,000 miles, which reaches all the important sections. It is planned some day to connect this system, by way of the Rhodesian railways, with those in Egypt. Trace the proposed "Cape-to-Cairo" route, as it is called, in Fig. 473. Estimate its length. Point out some of the advantages of such a railroad to eastern and southern Africa. The southern terminus of this railroad is to be Cape Town, where a breakwater has been constructed to make a good harbor.

Examine Fig. 473 and note the number of nations which have territory on the Gulf of Guinea. Note also the density of population there (Fig. 471). The land bordering the gulf is an unhealthful region, with high temperatures and heavy rains nearly all the year. In what temperature region is it (Fig. 468)? What type of vegetation

© Mirzaoff

Fig. 484. — A lantern merchant at Fez, Morocco

Morocco produces copper, and this merchant is shown making lanterns from thin copper plates. One of the important manufacturing centers of this country is Fez. Twice a year caravans, laden with leather, silk shawls, and other articles, go from here across the desert to Timbuktu. Great quantities of fezzes (red, brimless, cloth caps) are also made here. Fez is a sacred city and until recently none but a faithful Mohammedan was permitted to enter it without permission from the Sultan.

grows there (Fig. 470)? Why do European nations want such a disagreeable section? They have an ever increasing need of such foods as sugar, chocolate, coconut meat and oil, coffee, spices, and fruits. Fibers for certain textiles, ropes, and hats, rubber, ivory, and cabinet

What Great Britain expects from her possessions on the Gulf of Guinea

woods, moreover, are not obtained outside the tropics. The borders of the Gulf of Guinea are very productive of these goods, although the region is entirely unsuited for white colonization.

© Publishers' Photo Service

Fig. 485. — A part of the city and harbor of Algiers

Algiers is situated on the slope of a hill facing the Mediterranean. The modern part of the town, with its buildings noted for their dazzling white exterior, occupies the lower slope and spreads along the shore. The old town is on the heights. On the summit of the hill in the background are a Moslem mosque and an old fortress. The naval station here was an important base for Allied warships operating on the Mediterranean during the World War.

The doubtful value of the French portions of Africa. — The greater portion of northern Africa belongs to France. She controls not only Tunisia, Algeria, and a part of Morocco, but also most of the area to the south for some 2,000 miles. Name the divisions there that are shown in Fig. 473 to be French territory.

Since she has nearly as much land in Africa as Great Britain, and most of it lies nearer to Europe than the British possessions, we might expect it to be a great source of wealth to her. The coast of northern Africa, besides, has many of the same advantages as the southern coast of Europe.

The Mediterranean countries

The Atlas Mountains (Fig. 472) cause the winds from the north to give up much of their moisture, so that the coastal region just north of them is well watered; the rain comes mostly in winter. The products of this region are consequently similar to those of southern Europe. Compare the vegetation maps of the two continents (Figs. 293 and 470). Farther inland, where the country is drier, irrigation like that along the eastern coast of Spain is carried on (p. 362). This upland section is a natural wheat country, and large amounts of wheat and other grains are exported.

1. Possibilities of these countries

As in the mountains of Spain, there are extensive forests in the Atlas Mountains, the cork oak being the most valuable tree. There are likewise many minerals; but there is no coal.

In spite of these resources, the countries of the Atlas Mountain region would now be among the most backward in the world if it were not for the protectorates established over them by France. Let us see why.

2. Chief obstacle in the way of their development

The main difficulty is found in the habits and beliefs of the native inhabitants. In the eighth century Mohammedan tribes spread out from Asia over northern Africa. The Mohammedan religion teaches that everything which happens in one's life is fixed in advance and that nothing that one

can do will change it. Hence, Mohammedans do not favor progress; their methods of living, farming, and manufacturing are much the same as they were centuries ago. Note the populations of Morocco, Algeria, Tunisia, and the Italian possession Libia. Nearly nine tenths of the inhabitants of these countries are Mohammedans.

The French have had possession of Algeria since 1830 and of Tunisia since 1883. Although they have made advances, it will be a long time before the dense Mohammedan population can be won over to progressive ideas. However, the building of railroads (Fig. 473) and contact with Europeans are gradually causing a change of attitude.

Morocco, with the exception of a small Spanish zone in the north, became a French protectorate in 1912. The natives of a mountainous region in the interior, who are commonly called Riffians, have never willingly accepted European rule. Their discontent broke out into desperate warfare in 1924. They were finally subdued in 1926.

The Sahara, or Great Desert, is not a vast area of drifting sands with no water, vegetation, animal, or human life, as is often thought. The Libyan Desert in the east and a few sections in the west are such areas. In other parts there is bare rock or rock covered by thin soil. Many large sections, however, have vegetation suitable for grazing, and some parts are tilled.

Can the Sahara ever become valuable?

The northeast trade winds can never bring this region much rain. Why is this? Yet there is moisture in most sections a short distance below the surface, and the soil is very productive if water is applied. There are as many as 80,000 square miles of oases.

1. Important conditions in its favor

Usually an oasis is in a hollow, sometimes fifty or more feet below the surrounding land. Being so low, its surface is very near the ground water, so that vegetation can flourish. Some oases have springs and ponds. In some of them there is enough water to supply a population of 8,000 to 10,000 people and their live stock, consisting of cattle, sheep, goats, camels, and fowls; to irrigate orchards of date palms and temperate-zone fruits and crops, such as wheat and barley; enough, indeed, not only to supply human beings and animals, but to furnish a limited amount of vegetable products for export. One such oasis is 150 miles long and varies in width from twelve to fifty miles. Even where there are no oases, large supplies of water may often be reached by digging wells.

Sand storms, however, are a constant menace on the desert, and these artificial farms are always in danger of being buried by them. Even large oases, containing the remains of thousands of people and animals, have been found by explorers entirely covered by the drifting sand. Again, the products of these regions, consisting mainly of salt and dates, hardly justify the construction of many railroads. What difficulties can you think of in the way of railroad construction? The principal transportation routes are those connecting the Mediterranean coast with Timbuktu and Lake Chad. Trace these courses. Caravans have long followed these routes, bearing skins, ivory, ostrich feathers, gold dust, and slaves. The round trip usually requires several months. When possible, several small caravans combine to form a large one of perhaps 10,000 camels. This is largely for protection against the nomads who roam the desert and live by plundering caravans and oases.

2. Why these favorable conditions are not more beneficial

Although the Sudan (Fig. 473) and the other French territory along the Guinea coast lie only a short distance from the equator, Fig. 471 shows a dense population in much of this region. That fact suggests that this vast area may prove valuable for its raw products and as a market for European manufactures, even though it is quite unfit for white colonization.

The possible value of the Sudan and French Equatorial Africa

© *Brown Bros.*

Fig. 486. — A bridge over a stream in a Congo jungle

Since most of it has dry as well as hot seasons, it is a savanna region covered with grass from a few inches to several feet in height, with a small forested area. On account of its climate it has been the home of a semi-civilized people, known as the *Sudanese*, meaning black people.

Western Sudan has a great variety of products, some of which have long been in demand in Europe. Among them are rice, wheat, corn, sweet potatoes, yams, nuts, vegetables, tobacco, cotton, and coffee. The forests produce rubber, cacao, and indigo. Cattle are plentiful, and horses, donkeys, mules, and sheep are raised in great numbers. Large herds of elephants furnish meat for the natives and ivory for export.

1. Variety of agricultural products

Few products, however, have been raised in large enough quantities for export on account of the backward methods of agriculture and the poor facilities for transportation. Mohammedan influence (p. 460) has also been a serious drawback. The French, on the other hand, are trying to make the region more productive, as well as a better market for their manufactured goods. They keep down petty wars among the natives, and maintain schools. They furnish the natives with free seed and teach them better methods of farming. They also teach them how to collect the products from the forest region with least waste, and how to prepare them for market. In addition they are aiding in the construction of roads and railways. What railways do you find on the map (Fig. 473)?

2. Improvements being made by the French

There are several large cities in this region where manufacturing is carried on. Kano (Fig. 473), just outside French territory, is the chief commercial center of West Africa. Over 2,000,000 persons bent on the exchange of commodities pass through its gates each year. It is said that Kano clothes half the Sudan. A great deal of leather is tanned there; this, when exported through Morocco, is called Morocco leather. Tools for farmers and for workers in tin, brass, wood, leather, and

3. Industrial possibilities

cloth are produced in these cities. The metals thus used come from neighboring mines. Coal has also been found, and with the other minerals should form the basis of industrial development. Explain how such growth can benefit France.

The value of Madagascar

Although there are a number of islands near the coast of Africa, Madagascar is the only one of much value except as a naval base. This island is larger than any of our states except Texas. There are few other regions of like area in the world that have such a variety of plant and animal life, and that offer man such a variety of opportunities for making a living. Although it lies mostly within the tropics, its mountainous interior gives it a varied climate. Forests cover one eighth of the area and yield many valuable products, such as gums, resins, fibers, bark for tanning and dyeing, and rubber. Savanna lands furnish pasturage. In the well-watered, elevated, subtropical valleys, in the tropical wet lowlands, in the savannas, and in the semi-desert areas may be grown almost all the crops of the habitable world from oats to rice and coffee, from apples and pears to figs, bananas, and pineapples. Name some of the products you would expect each of the above sections to produce.

Gold, silver, iron, copper, and many other valuable minerals abound in the mountains.

The French are working hard to develop all the resources of this rich island. It will probably become their most valuable African possession, with the possible exception of the Sudan. Its main disadvantage lies in its distance from Europe. What route would probably be followed from Madagascar to Europe (Fig. 495)?

How the Congo Basin compares in value with the Amazon. — The greater part of the Congo Basin belongs to Belgium. Let us see how this region compares in value with the Amazon Basin, which resembles it in many respects; for they lie in nearly the same latitude and have many of the same products. Compare them in area.

In agriculture

Although the valley of the Congo is the smaller, it is by far the more important. Fig. 469 shows that only a small part of this basin receives heavy rains throughout the year. Is the corresponding part of the Amazon Basin larger or smaller (Fig. 255)? As a result of the lighter rainfall, much of the Congo region has vegetation less luxuriant and forests less dense than those of the Amazon. Large areas are covered only with grass, and agriculture is, therefore, far more important. The chief crops in the portions with heavier rainfall are cacao, potatoes, corn, yams, and rubber. In the less rainy sections sugar, rice, vanilla beans, cotton, and coffee are grown. Coffee grows wild in some sections on the well-drained slopes, and many coffee plantations have been started merely by thinning out the trees. How does such agriculture compare with that of the Amazon?

In population

Fig. 471 shows that the population, also, is much greater in the Congo region. Thus, while the climate is no better for the white man than that of the Amazon Valley, the great native population makes it possible to develop agriculture more extensively. These natives readily learn modern ways, so that attempts to improve farming and living conditions are usually sucessful.

In means of transportation

Transportation, also, is better developed here. While the Congo River, in comparison with the Amazon, has the disadvantage of rapids and falls, railroads have been built along

the stretches that cannot be navigated and it has thus been made possible to go nearly the full length of the river by boat and train. Trace the route and note the location of the railroads. The Congo Basin, however, has more outlets than the Amazon. Trace the railroad connecting the Congo with the east coast. A line is proposed from Stanley Falls to the Nile Valley road. The Rhodesian railroad has already been built to the Katanga Highland (Fig. 472), which is rich in copper, and still another is to be built eastward across Angola. In what ways are these roads likely to give the Congo Basin advantages for development superior to those in the Amazon Basin?

What Portugal is doing to make her African possessions more valuable. — Although the African possessions of Portugal cover somewhat more than 900,000 square miles, they have not been very profitable to her. Locate them. This is partly explained by the fact that Portugal has not had the foresight shown by some of the other nations in developing the resources. For instance, the rubber trees of Angola have been nearly exhausted, and little attempt has been made to replace them.

In possibilities for agriculture

The products of Angola are similar to those of the countries on the Gulf of Guinea. Coffee and rubber have been the largest exports. Vigorous efforts are now being made to increase the output of cotton. The government is building railroads in several sections and plans to connect them, by way of the Rhodesias, with Portuguese East Africa. Trace the portions of the route that have been completed.

Portuguese East Africa exports rubber, sugar, beeswax, and coconuts, besides ores of various sorts. It lies in a more rainy section than other parts of South Africa (Fig. 469); its agricultural products are consequently more varied. Lack of transportation has been a serious disadvantage. Now, however, plans for an extensive railroad system are under way; it is expected that by 1930 there will be a network of railroads connecting with the South African system and with the countries to the north. What important city is already connected with Beira?

Why Ethiopia has remained independent, and its future prospects. — Ethiopia (also called *Abyssinia*), like Egypt and the small state Liberia, is not controlled by a European government (Fig. 473). The explanation of this lies in the fact that it is the only part of Africa which is very mountainous (Fig. 472). The inhabitants have made little advance, because they have kept themselves shut up in their mountain fastnesses and have not had enough contact with outsiders to acquire modern ideas.

Most of the transportation is by pack mule or camel over trails which can hardly be called roads. There are only three small schools for native children, having only a few hundred pupils. How many children ought to be going to school in a country with the population of Ethiopia (p. 480)?

The natural resources, however, are valuable. The mountains cause abundant rainfall, and the altitude of this region protects it from the high temperatures suggested by its latitude. The products vary from tropical to subtropical. Why? Forests of ebony and mahogany, and cultivated plants such as the banana, sugar cane, cotton, fig, orange, and lime thrive there, as well as fruits, cereals, vegetables, and forests of the temperate zone. In spite, therefore, of its present backward condition, it ought, with

proper development, to become one of the richest portions of Africa.

Our special interest in Liberia. — Liberia is a small negro republic. It has about the hottest climate known on the earth. Americans established it about 100 years ago as a home for freed slaves from the United States. The capital was named for our President Monroe. The government is copied after ours, but only negroes are allowed to vote.

Facts to be especially well fixed. — 1. How Africa is divided among European nations. 2. Location of Cairo; Alexandria; Suez Canal; Victoria Nyanza; Lake Chad; Kimberley; Johannesburg; Algiers; Tunis. 3. Location of the Nile River; the Niger; the Congo; the Zambezi. 4. The temperature regions of the continent. 5. The distribution of rainfall. 6. Surface features. 7. Chief products.

Problems for independent study. — 1. What factors can you see in the location and surroundings of Egypt that have favored its existence as an independent nation for thousands of years? 2. Explain the meaning of the statement that "Egypt is the Nile and the Nile is Egypt." Carpenter, F. G.: *Africa*, pp. 106–109 (American Book); Dakin, W. S.: *Great Rivers of the World*, pp. 15–31 (Macmillan); Journal of Geography, vol. 16, pp. 241–244; Chamberlain, J. F., and Chamberlain, A. H.: *Africa*, rev. ed., pp. 148–163 (Macmillan). 3. Between equatorial East Africa and the Congo is a great valley caused by a sinking of the earth. What lake occupies a part of this depression? What is the largest lake in Africa? How does it compare in size with Lake Superior? Look up other information about the lakes of Africa. 4. Sketch the four great rivers of Africa. 5. Make an extensive comparison between Madagascar and Cuba. The New International Encyclopedia, vol. 14, pp. 612–614 (Dodd, Mead); Encyclopædia Britannica, vols. VII and XVII. 6. If you were going to make your home in Africa, which section would you prefer? Why? Journal of Geography, vol. 18, pp. 331–339; Winslow, I. O.: *Distant Countries*, pp. 150–158 (Heath). 7. Cairo is one of the especially interesting points for tourists. What are its attractions? Carpenter, F. G.: *Africa*, pp. 127–144; Kelly, R. T.: *Peeps at Many Lands: Egypt*, Chapters III and IV (Macmillan). 8. Read about our short war with Tripoli in 1804–1805. Elson, H. W.: *History of the United States*, rev. ed., p. 359 (Macmillan); or any other history of the United States. 9. Find some facts about Livingstone, Stanley, and other African explorers. 10. Find out all you can about the pyramids of Egypt. 11. The French plan to make Dakar an important port by connecting it by rail with Oran. What advantages will this give for trade between the Sudan and France? Trace a short rail-and-water route from Marseille through Dakar to Buenos Aires. 12. In your opinion is Africa likely to increase greatly in population as the other continents become overcrowded?

PART VIII. THE UNITED STATES IN COMPARISON WITH OTHER COUNTRIES

The area of the United States and its dependencies compared with that of other countries. — The United States even without its dependencies is one of the largest countries in the world. As we have seen, its area is somewhat greater than that of the entire continent of Australia. How does it compare in area with the more important countries of Europe? With India? With China?

From The Geography of the World's Agriculture

Fig. 487

Our foreign possessions considerably increase our area. Which is our largest outlying territory and what is its area? Which is our largest possession in the tropics? Locate it. What other dependencies have we (p. 167)?

Several other countries have far greater foreign possessions than we have. Great Britain has the most. Fig. 495 shows its dominions, colonies, and other dependencies. Name and locate the more important ones. In the same map, what other countries are shown to have foreign possessions? Name some of their more important colonies.

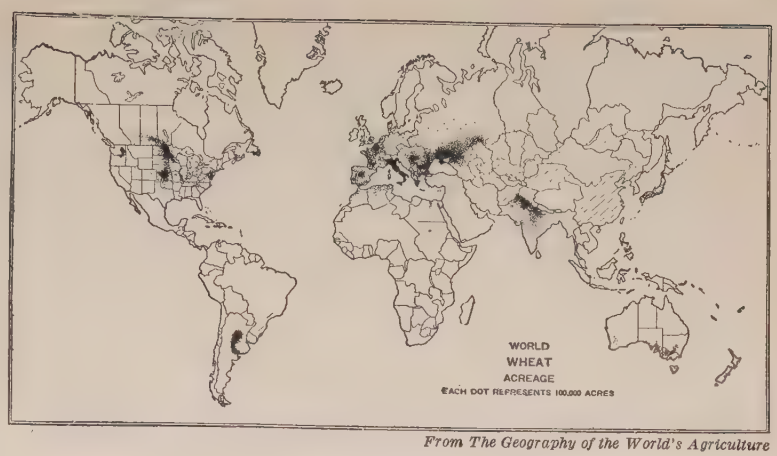
A comparison of the United States with other countries in population. — From the Appendix find out which are the six most populous countries in the world. What are their names? Note the rank of the United States. Compare the population maps of the continents (Figs. 10, 253, 294, 403, 460, and 471). Which sections of the world are most crowded? How does the New World compare with the Old World in this respect? How many persons has the United States per square mile? How many acres of land does that allow for each of our inhabitants on the average? Compare that amount with the number in Belgium; in China; in Argentina. How are such facts of great importance when possible growth is considered?

How the United States compares with other countries in farm products. — In spite of the fact that some nations are larger and more densely populated, the United States leads the world in many farm products, and approaches leadership in many others. Fig. 487 shows that no country is a close rival to us in production of corn. What other countries, however, raise a large amount of it? Note the importance of Mexico and Argentina in corn production. Corn is mainly a New World crop.

In production of corn and wheat

Fig. 488 shows the countries in which wheat is extensively grown. Is wheat more

or less widely cultivated than corn? How do you account for this fact? What countries produce large amounts of wheat? Of both corn and wheat?



From The Geography of the World's Agriculture

Fig. 488

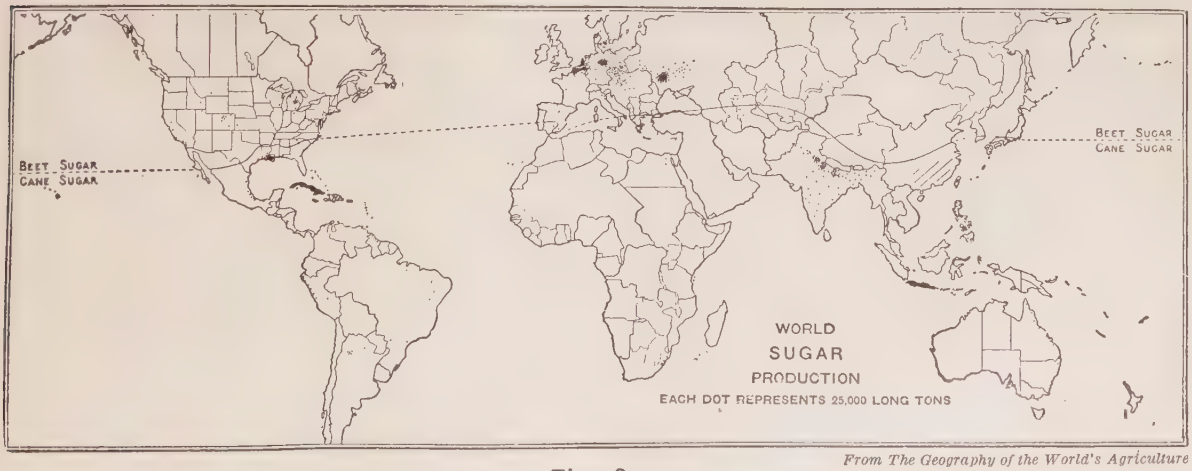
In production of sugar

The world's production of sugar is indicated in Fig. 489. Note that only beet sugar is produced north of a certain line, and only cane sugar south of it. What countries grow sugar beets extensively? Which of our states? Which of our states grow a considerable amount of sugar cane? What islands produce a great amount of it? Is any cane grown in Europe? In Asia? How do you account for the fact that sugar beets are not cultivated in the southern hemisphere? While the sugar-beet industry is quite new, about one third of the world's sugar comes from that source.

In production of potatoes and rice

Although the potato originated in America, it is now cultivated far more in Europe than here. In fact, as is suggested in Fig. 490 Europe produces three fourths of the world's crop. The introduction of potatoes into Europe has greatly helped to make possible the dense population of that continent. While several countries raise a far greater quantity than we do, potatoes are our most widely distributed crop. They are cultivated in every one of our states, and in almost every county in each state.

Rice, on the other hand, is mainly confined to the Orient (Fig. 491). Name the countries there that raise a great amount of it. What countries in other continents produce rice?



From The Geography of the World's Agriculture

Fig. 489

From The Geography of the World's Agriculture

Fig. 490

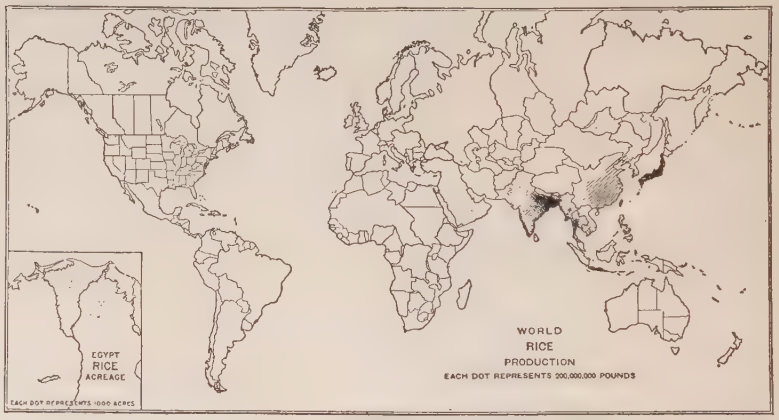
Coffee and tea are not cultivated at all within our boundaries. As shown by Fig. 492, what countries of the New World lead in the production of coffee? What countries of the Old World produce coffee? There are four countries and two large islands that grow tea. Name them (see Index).

In production of coffee and tea

The wide distribution of cattle is shown in Fig. 493. How does the United States compare with other countries? It should be kept in mind that the cattle of India are used chiefly as beasts of burden rather than for either meat or milk.

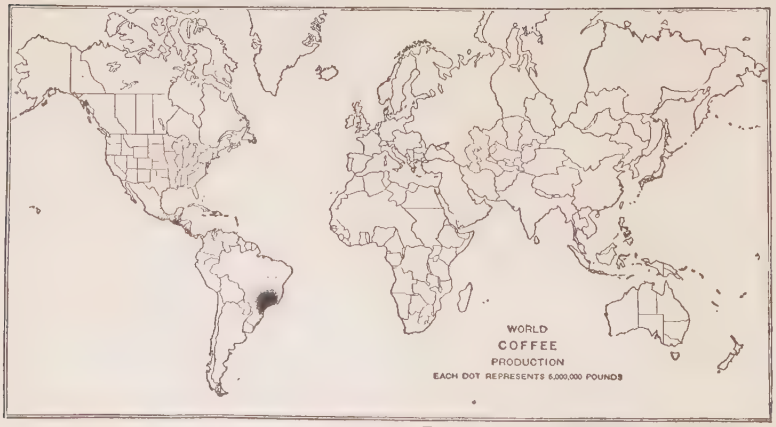
In production of cattle, swine, and sheep

Fig. 494 shows the world distribution of swine. State some of the facts that you observe there. China is known to have a large number; but no one knows how many. One reason for their absence from Mohammedan countries is that the Mohammedan religion forbids their use. Note the rank of the United States in swine production. Our superiority over all other countries in that industry approaches our superiority in corn production. How can you explain that fact?



From The Geography of the World's Agriculture

Fig. 491



From The Geography of the World's Agriculture

Fig. 492

From The Geography of the World's Agriculture

Fig. 493

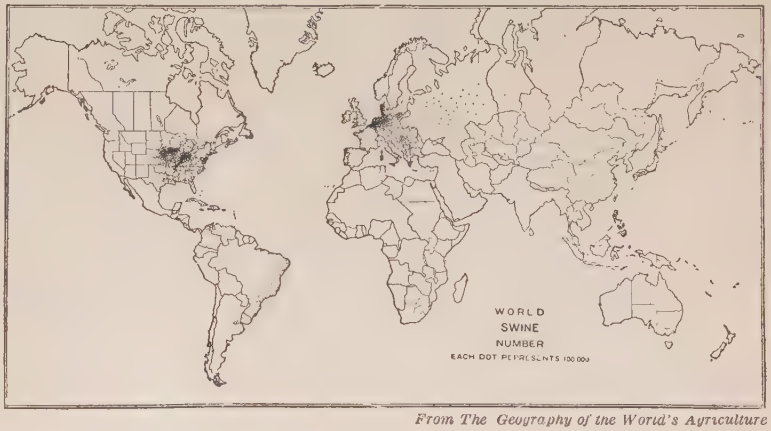
Which continents lead in the production of sheep, as indicated in Fig. 496? Note how important the southern hemisphere is in this industry. Name the particular countries there that produce a great number. Estimate the rank of the United States in number of sheep. What reasons can you give for the large number in the British Isles? In the Balkan Peninsula? In Argentina and Uruguay?

In production of cotton and raw silk

Cotton production is very much more restricted than that of wool. The cotton area forms a very narrow belt around the earth. What reasons can you give for this fact (p. 101)? What countries of the Old World produce cotton (pp. 405 and 453)? What portion of the world's supply is produced in the United States (p. 210)?

Production of raw silk is even more restricted than that of cotton, being confined almost entirely to the Old World. Name the countries that lead in its production (pp. 314 and 417).

How the United States compares with other countries in mineral products. — Fortunately the most important mineral, coal, is distributed widely over the earth. In Fig. 497, what countries are shown to be well supplied? What important countries have little? How does the



From The Geography of the World's Agriculture

Fig. 494

Questions on Fig. 495. — 1. It is impossible to show the surface of a globe on a flat sheet of paper without distortion, or wrong indication of areas or directions. Most maps in this book, with slightly curved meridians and parallels, show area better than they show direction. This map shows direction better than it does area. What black-and-white maps in this book does this map resemble? 2. On this map, countries far from the equator are made to appear much larger than they really are. How does Greenland appear to compare in area with South America? Alaska with Australia? For the true comparisons, see p. 477. 3. Explain by the use of a globe why the shortest steamship route between San Francisco and Yokohama appears curved on this map. Note also the shortest route from New York to Liverpool.

ARCTIC OCEAN
UNION OF RUSSIAN REPUBLICS
ASIA
Arctic Circle
Lena
Irkutsk
Amur R.
SEA OF OKHOTSK
BERING SEA
PRIBILOF IS.
ALEUTIAN ISLANDS
Unalaska
Nome
Fairbanks
Dawson
St. Michael
Seward
Skagway
Juneau
Sitka
Prince Rupert
Vancouver
Victoria
Seattle
Port Nelson
Minneapolis
Missouri
AMERICA
UNITED
San Francisco
Los Angeles
Denver
Houston
Galveston
MEXICO
Mazatlan
Mexico
Acapulco
Rio Grande
Vera Cruz
Puerto Mexico
North Magnetic Pole
Vladivostok
Hakodate
Sea of Japan
Osaka
Tokyo
Yokohama
Nagasaki
Peking
Tientsin
Hwang R.
CHINA
Yellow Sea
Hankow
Shanghai
Yangtze R.
Canton
Hongkong
TAIWAN
Tropic of Cancer
INDIA
BURMA
Rangoon
SIAM
Bangkok
MALAY PEN.
Singapore
CHINA SEA
LUZON I.
Manila
PHILIPPINE ISLANDS
MINDANAO I.
PELEW IS.
YAP I.
MARIANAS IS.
GUAM
MARCUS I.
WAKE I.
MIDWAY I.
HAWAIIAN ISLANDS
Honolulu
INTERNATIONAL DATE LINE
PACIFIC OCEAN
MARSHALL IS.
CAROLINE IS.
GILBERT IS.
HOWLAND I.
BAKER I.
FANNING I.
PHOENIX IS.
UNION IS.
Pago Pago
SAMOA IS.
TUAMOTU ARCHIPELAGO
SOCIETY IS.
TAHITI
MARQUESAS IS.
GAMBIER IS.
COOK IS.
AUSTRAL IS.
TONGA IS
FIJI IS.
Suva
NEW CALEDONIA
NEW HEBRIDES
SOLOMON IS.
ELLICE IS.
NORFOLK I.
COLON ARCHIPELAGO (GALAPAGOS IS.)
EASTER I.
Padang
SUMATRA
BORNEO
Equator
EAST INDIES
NEW GUINEA
JAVA
Batavia
Darwin
Tropic of Capricorn
AUSTRALIA
Perth
Albany
Adelaide
Melbourne
Sydney
Canberra
TASMANIA
Hobart
Auckland
Wellington
NEW ZEALAND
INDIAN OCEAN
Williams Engraving Co., N.Y.
100° Longitude 120° East 140° from 160° Greenwich 180° 160° 140° Longitude 120° West 100°

Fig. 495

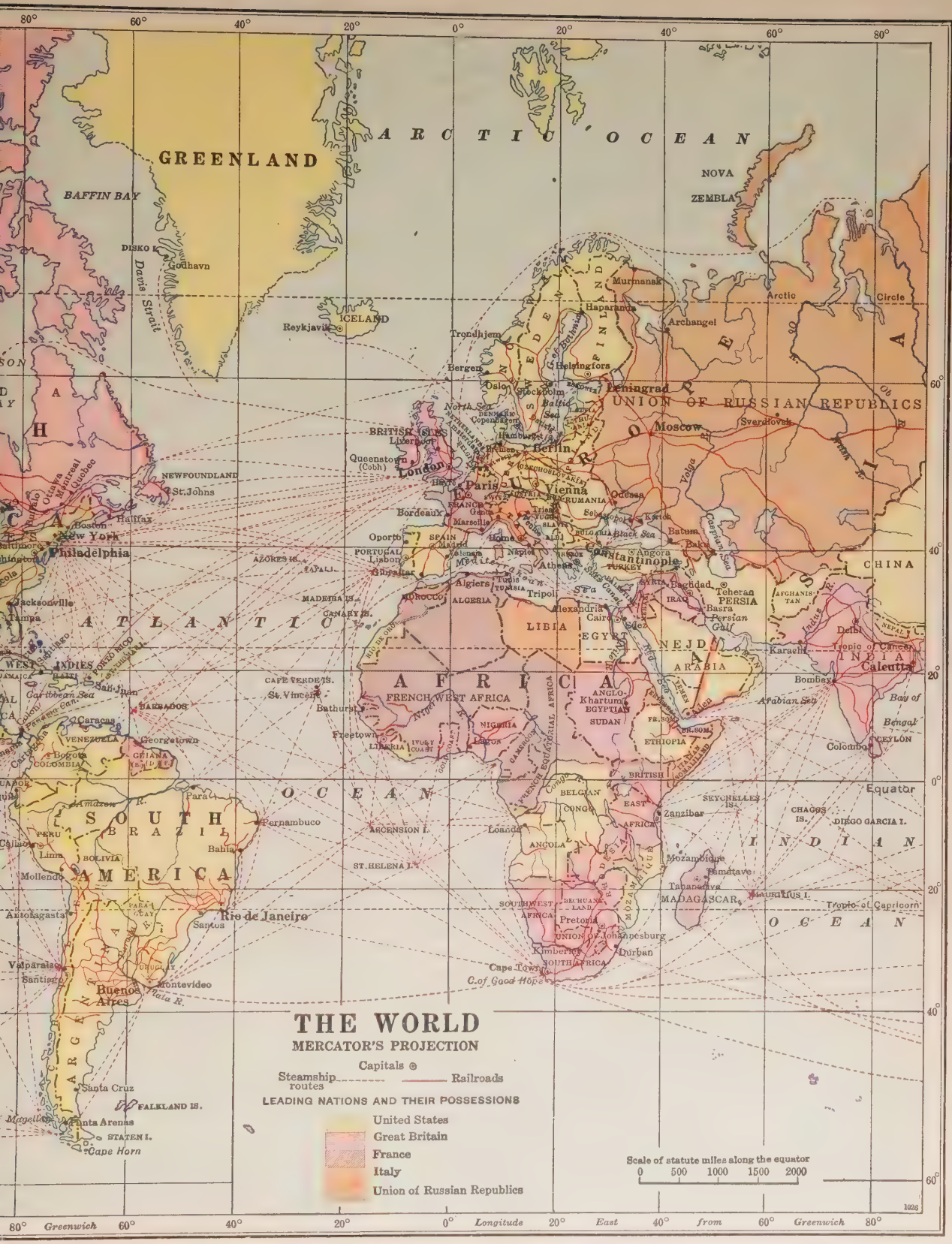
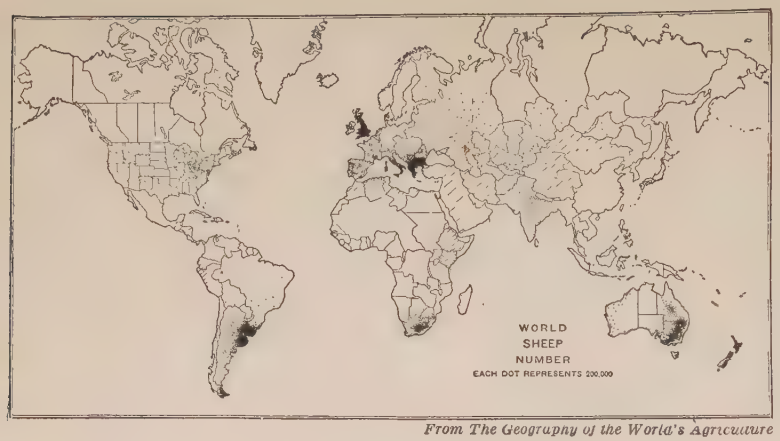

THE WORLD
MERCATOR'S PROJECTION
Capitals ⊙
Steamship routes
Railroads
LEADING NATIONS AND THEIR POSSESSIONS
United States
Great Britain
France
Italy
Union of Russian Republics
Scale of statute miles along the equator
0 500 1000 1500 2000
ARCTIC OCEAN
GREENLAND
BAFFIN BAY
ICELAND
NOVA ZEMBLA
UNION OF RUSSIAN REPUBLICS
Moscow
Leningrad
Murmansk
Archangel
Arctic Circle
NORTH SEA
BRITISH ISLES
London
Paris
Berlin
Vienna
Constantinople
Odessa
Black Sea
Caspian Sea
Volga R.
Ural R.
NEWFOUNDLAND
St. Johns
Halifax
Boston
New York
Philadelphia
Jacksonville
Tampa
ATLANTIC OCEAN
WEST INDIES
Caribbean Sea
Panama Canal
Caracas
Georgetown
Bogota
Lima
Mollendo
Antofagasta
Valparaiso
Santiago
Buenos Aires
Montevideo
Rio de Janeiro
Santos
Pernambuco
SOUTH AMERICA
Cape Horn
Magellan
Punta Arenas
Santa Cruz
FALKLAND IS.
STATEN I.
AZORES IS.
MADEIRA IS.
CANARY IS.
CAPE VERDE IS.
Gibraltar
Algiers
Tripoli
Tunis
MOROCCO
ALGERIA
TUNISIA
LIBYA
EGYPT
Alexandria
Cairo
Suez
Red Sea
Persian Gulf
Baghdad
Teheran
PERSIA
Basra
ARABIA
NEJD
Karachi
Delhi
Bombay
Calcutta
INDIA
CHINA
Arabian Sea
Bay of Bengal
Colombo
CEYLON
FRENCH WEST AFRICA
Bathurst
Freetown
LIBERIA
NIGERIA
Lagos
ANGLO-EGYPTIAN SUDAN
ETHIOPIA
BRITISH EAST AFRICA
BELGIAN CONGO
Loanda
ANGOLA
Zanzibar
Mozambique
Beira
Tananarive
MADAGASCAR
SEYCHELLES IS.
CHAGOS IS.
DIEGO GARCIA I.
MAURITIUS I.
ASCENSION I.
ST. HELENA I.
SOUTHWEST AFRICA
BECHUANALAND
Pretoria
UNION OF SOUTH AFRICA
Johannesburg
Kimberley
Durban
Cape Town
C. of Good Hope
INDIAN OCEAN
Equator
Tropic of Capricorn
Tropic of Cancer
Greenwich
Longitude East from Greenwich
1026

Fig. 495



From The Geography of the World's Agriculture

Fig. 496

United States rank with other nations in this product?

The next most important mineral is iron. Fig. 497 also shows the distribution of iron ore. Name the leading countries in production of iron ore. How many of them are also important coal countries?

Fig. 498 shows the countries that lead in the production of petroleum. Note the rank of the United States in each.

How the United States compares with other countries in manufacturing and in railroad transportation. — What two continents clearly lead in manufacturing? Taking into account the area of our country, the number of our inhabitants, the abundance of our raw materials from farms and mines, and our great railroad mileage, it is not surprising that we lead in the value of manufactures. In this chapter twelve farm products and three minerals have been considered. In how many of these products does the United States surpass all other countries? In how many of them does it rank at least among the leading countries?

Foreign commerce. — In spite of the vast extent of our industries, we are by no means independent of other countries. We should suffer less from hunger than many of them, even if there were no foreign trade;

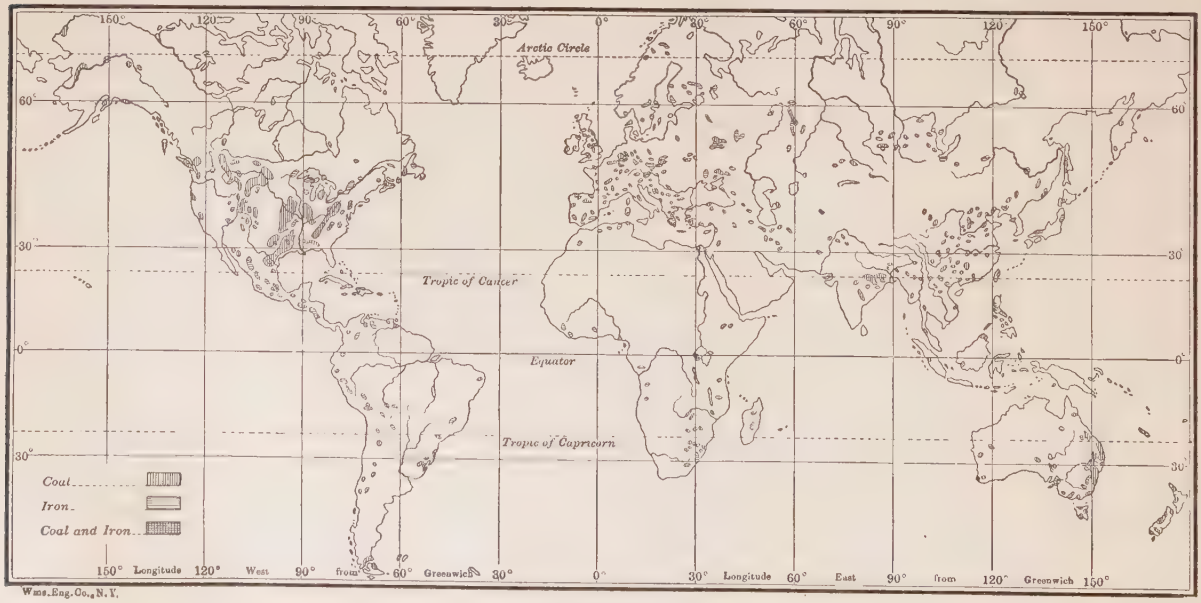

Arctic Circle
Tropic of Cancer
Equator
Tropic of Capricorn
Coal
Iron
Coal and Iron
150° Longitude 120° West 90° from 60° Greenwich 30° 0° 30° Longitude 60° East 90° from 120° Greenwich 150°
Wms. Eng. Co., N. Y.

Fig. 497

but we could hardly be prosperous. Every one of our states is dependent upon the others in scores of ways; and in much the same manner, any one nation is dependent upon others. Any country, like China for example, that has little contact with foreign lands must lack many advantages on that account.

The dependence of the United States upon other countries

Four of the articles which we do not produce at all are coffee, tea, raw rubber, and raw silk. Yet if we had to do without these we would think we were enduring many hardships. We are just as dependent upon other countries for the export of our surplus goods as for imports. We should have a hard time, indeed, if we could not sell our cotton, foodstuffs, and metal products abroad. Observe from Fig. 232 some of the products that enter and leave our chief seaports.

Our location bordering the North Atlantic is a great advantage for foreign commerce. A large proportion of the more progressive and productive nations of the earth borders that ocean; and its narrowness encourages commerce between them. It is the world's greatest highway when the number of trade routes, the volume of commerce, and the value of freight are considered.

Our international trade routes

1. Advantage of our location on the Atlantic

How much more important it is for commerce than any other ocean is suggested by the rank of its ports. The six principal ports of the world are as follows:

New York, with 4.42 billion dollars' worth of imports and exports.

Liverpool, with 4.00 billion dollars' worth of imports and exports.

London, with 3.68 billion dollars' worth of imports and exports.

Bordeaux, with 2.26 billion dollars' worth of imports and exports.

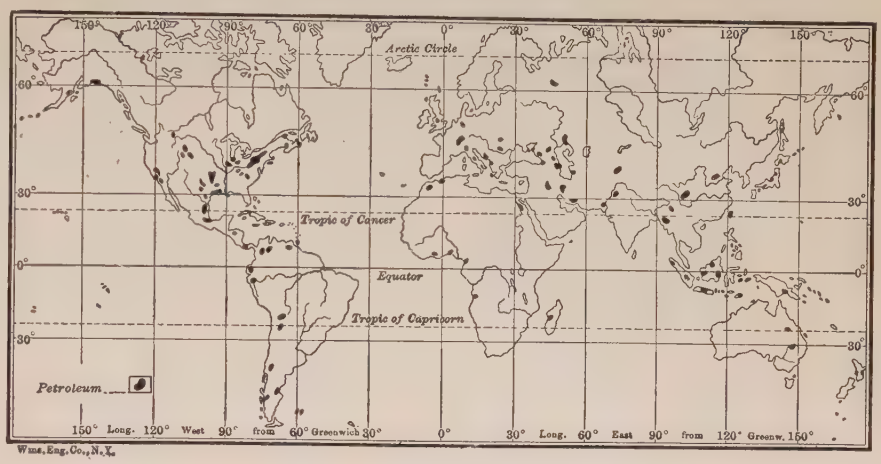

Arctic Circle
Tropic of Cancer
Equator
Tropic of Capricorn
Petroleum
150° Long. 120° West 90° from 60° Greenwich 30° 0° 30° Long. 60° East 90° from 120° Greenw. 150°
Wms. Eng. Co., N. Y.

Fig. 498

Hamburg, with 2.00 billion dollars' worth of imports and exports.

Marseille, with 1.93 billion dollars' worth of imports and exports.

The next ten, in order of importance, are Antwerp, Havre, Genoa, Buenos Aires, Calcutta, Kobe, Bombay, Singapore, Manchester, and Yokohama. How many of these ports are upon the Atlantic or its bays and gulfs?

In Fig. 495, note the number of routes represented crossing the Atlantic. With what foreign ports on the Atlantic are New York and Philadelphia connected by shipping lines? Show the routes in this figure by which some of our principal imports are brought to us. Likewise show the routes by which some of our principal exports reach their destinations.

Our shortest routes to the Orient start from Seattle and from San Francisco. Show by the use of a globe that the route from Puget Sound is shorter than that from San Fran-

REFERENCE MAP OF THE
UNITED STATES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300 400
National capitals ✱
State capitals ⊙
Railroads
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
WILLIAMS ENGRAVING CO., N.Y.
117°
113°
109°
105°
101°
Longitude
West
45°
41°
37°
33°
29°
25°
PACIFIC OCEAN
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
ALBERTA
SASKATCHEWAN
MANITOBA
MEXICO
GULF OF CALIFORNIA
Colorado R.
Rio Grande
Missouri R.
Yellowstone R.
Columbia R.
Snake R.
Pecos R.
Canadian R.
Red R.
Arkansas R.
Platte R.
Grand Canyon
Death Valley
Salton Sea
Great Salt Lake
Yellowstone National Park
Grand Junction
Pikes Peak
Longs Peak
Mt. Shasta
Mt. Whitney
Mt. Rainier
Mt. Hood
Mt. Jefferson
Mt. Adams
Mt. Baker
Mt. Pleasant
Mt. Ellen
Mt. Pennell
Mt. Holmes
Mt. Wilson
Mt. Pinos
Mt. Diablo
Mt. Lassen
Mt. Taylor
Mt. Graham
Mt. Lemmon
Mt. Ord
Mt. Dellenbaugh
Mt. Trumbull
Mt. Dutton
Mt. Ellsworth
Mt. Emmons
Mt. Harvard
Mt. Princeton
Mt. Elbert
Mt. Massive
Mt. Evans
Mt. Blanca
Mt. Lincoln
Mt. Sneffels
Mt. Wilson
Mt. Hayden
Mt. Ouray
Mt. Sopris
Mt. Lamborn
Mt. Antero
Mt. Shavano
Mt. Yale
Mt. Elbert
Mt. Harvard
Mt. Princeton
Mt. Massive
Mt. Evans
Mt. Blanca
Mt. Lincoln
Mt. Sneffels
Mt. Wilson
Mt. Hayden
Mt. Ouray
Mt. Sopris
Mt. Lamborn
Mt. Antero
Mt. Shavano
Mt. Yale
Mt. Elbert
Mt. Harvard
Mt. Princeton
Mt. Massive
Mt. Evans
Mt. Blanca
Mt. Lincoln
Mt. Sneffels
Mt. Wilson
Mt. Hayden
Mt. Ouray
Mt. Sopris
Mt. Lamborn
Mt. Antero
Mt. Shavano
Mt. Yale

Fig. 499

Cities with over 1,000,000 New York
Cities with 200,000 to 1,000,000 Cleveland
Cities with 50,000 to 200,000 Richmond
Other places Elmira
from Greenwich
93°
89°
85°
81°
77°
73°
69°
45°
41°
37°
33°
29°
25°
ATLANTIC OCEAN
GULF OF MEXICO
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Mississippi Delta
Florida Strait
Key West
Nassau
BAHAMA ISLANDS
Chicago
Milwaukee
Minneapolis
St. Paul
Detroit
Cleveland
Toronto
Buffalo
Rochester
Pittsburgh
Philadelphia
New York
Boston
Providence
Baltimore
Washington
Richmond
Norfolk
Atlanta
Charleston
Savannah
Jacksonville
Miami
Tampa
St. Petersburg
New Orleans
Mobile
Memphis
Nashville
Louisville
Cincinnati
Columbus
Indianapolis
St. Louis
Kansas City
Omaha
Des Moines
Duluth
Winnipeg
Montreal
Quebec
Ottawa
Toronto
Hamilton
Buffalo
Rochester
Albany
Syracuse
Scranton
Harrisburg
Reading
Trenton
Atlantic City
Wilmington
Dover
Annapolis
Delaware Bay
C. May
C. Hatteras
C. Lookout
C. Fear
C. Canaveral
C. Sable
Albemarle Sound
Pamlico Sound
Chesapeake Bay
Apalachicola Bay
Tampa Bay
Lake Okeechobee
Palm Beach
West Palm Beach
Fort Myers
Orlando
Tallahassee
Pensacola
Biloxi
Gulfport
Baton Rouge
Vicksburg
Natchez
Meridian
Birmingham
Montgomery
Selma
Macon
Columbus
Augusta
Savannah
Brunswick
Fernandina
St. Augustine
Daytona
Ocala
Gainesville
Jacksonville
Wilmington
Raleigh
Greensboro
Winston-Salem
Charlotte
Asheville
Knoxville
Chattanooga
Nashville
Louisville
Cincinnati
Columbus
Dayton
Toledo
Akron
Cleveland
Erie
Pittsburgh
Wheeling
Charleston
Huntington
Lexington
Frankfort
Evansville
Indianapolis
Terre Haute
Springfield
Peoria
Chicago
Milwaukee
Madison
Green Bay
Duluth
Minneapolis
St. Paul
Rochester
La Crosse
Eau Claire
Wausau
Marquette
Houghton
Sault Ste. Marie
Port Arthur
Fort William
Rainy Lake
Lake of the Woods
Winnipeg
Brandon
Regina
Saskatoon
Edmonton
Calgary
Vancouver
Victoria
Seattle
Portland
San Francisco
Los Angeles
San Diego
Salt Lake City
Denver
Cheyenne
Omaha
Lincoln
Kansas City
St. Louis
Memphis
Vicksburg
New Orleans
Houston
Galveston
Dallas
Fort Worth
Austin
San Antonio
El Paso
Albuquerque
Santa Fe
Phoenix
Tucson
Los Angeles
San Diego
San Francisco
Portland
Seattle
Spokane
Boise
Salt Lake City
Cheyenne
Denver
Omaha
Kansas City
St. Louis
Chicago
Milwaukee
Minneapolis
Duluth
Winnipeg
Montreal
Quebec
Ottawa
Toronto
Buffalo
Rochester
Albany
Boston
Providence
New York
Philadelphia
Baltimore
Washington
Richmond
Norfolk
Atlanta
Charleston
Savannah
Jacksonville
Miami
Tampa
New Orleans
Mobile
Memphis
Nashville
Louisville
Cincinnati
Columbus
Indianapolis
St. Louis
Kansas City
Omaha
Des Moines

cisco Bay. Trace the routes connecting Seattle and San Francisco with Yokohama. Name other important transpacific ports. Why is Honolulu an especially welcome stopping place for vessels (p. 173)?

2. How we trade with the Orient

Our Atlantic coast cities trade with the Orient by two routes, as shown in Fig. 495. Trace those leading through the Panama Canal, and name the principal ports to which they lead. Can you name some of our imports and exports that cross the Pacific, and point out the courses that the vessels carrying them must take?

The other principal water route from New York to the Orient leads through the Suez Canal. Follow its course in Fig. 495. The leading ports upon it after entering the Mediterranean Sea from the west are Marseille, Genoa, Trieste, Alexandria, Bombay, Calcutta, and Singapore. Name other less important ports along the route. While the Pacific is the second most important waterway in the world, its volume of trade is only about one third that of the Atlantic.

The distance from New York to Hongkong by way of the Suez Canal is 13,370 miles, while that by way of the Panama Canal is 13,163 miles. The difference therefore is not important. Which route do you think most vessels carrying freight between these two points are likely to take in the future?

Facts to be especially well fixed. — 1. The area and population of the United States compared with that of leading European countries; also with that of China and India. 2. The farm products in which we lead. 3. Those for which we are entirely dependent on other countries. 4. Our rank in production of coal and iron ore. 5. Our rank in manufacturing. 6. The principal international routes for transportation of our imports and exports.

Problems for independent study. — 1. Find how the Panama Canal compares in importance with the Suez Canal. 2. Why is there no important shipping line from New York around southern Africa to the Orient? 3. Sailing vessels frequently do not follow the same course as steamships. Explain why, and give illustrations. 4. Show by the use of a globe the shortest route between San Francisco and Yokohama.

APPENDIX

TABLES OF AREA, POPULATION, ETC.

NOTE. — The figures, 1920, 1926, etc., refer to the year in which the census was taken or the estimate was made. Areas and populations are those included within the present boundaries of the various countries, although the census of the districts which make up the areas may have been taken before the fixing of the boundaries. Estimates are indicated by asterisks.

THE EARTH

Land area (square miles)	56,255,000	Length of axis (miles)	7,900
Water area (square miles)	140,295,000	Length of equator (miles)	24,900

CONTINENTS AND COUNTRIES

	Area in Square Miles	Population
North America	**9,411,500**	**145,183,000***
Alaska, 1920	590,900	55,000
Bermuda Islands, 1924	20	24,000
Canada, 1921	3,729,700	8,789,000
Alberta	255,300	588,000
British Columbia	355,900	525,000
Manitoba	251,800	610,000
New Brunswick	28,000	388,000
Nova Scotia	21,400	524,000
Ontario	407,300	2,934,000
Prince Edward Island	2,200	89,000
Quebec	706,800	2,361,000
Saskatchewan	251,700	758,000
Yukon Territory	207,100	4,000
Northwest Territories	1,242,200	8,000
Central America	215,654	5,917,000*
British Honduras, 1921	8,600	45,000*
Costa Rica, 1924	23,000	507,000*
Guatemala, 1920	42,400	2,005,000
Honduras, 1923	46,300	673,000*
Nicaragua, 1920	49,200	638,000
Panama (exclusive of the Canal Zone), 1921	32,400	442,000
Panama Canal Zone, 1925	554	27,000
Salvador, 1924	13,200	1,580,000*
Greenland, 1921	827,300	14,000
Labrador, 1924	120,000	4,000
Mexico, 1921	767,200	14,235,000
Newfoundland, 1924	42,700	258,000
United States, 1920	3,027,000	105,711,000
West Indies	90,967*	10,200,000*
Bahama Islands, 1921	4,400	53,000
Cuba, 1924	44,200	3,369,000
Dominican Republic, 1921	19,300	897,000
Haiti, 1924	10,200	2,300,000
Jamaica, 1921	4,400	858,000
Lesser Antilles, 1921	4,900	1,350,000*
Porto Rico, 1922	3,435	1,347,000
Virgin Islands of the U. S., 1917	132	26,000
South America	**7,083,600**	**66,924,000**
Argentina, 1925	1,153,100	9,839,000*
Bolivia, 1925	514,200	2,990,000*
Brazil, 1920	3,285,300	30,636,000
British Guiana, 1924	89,500	301,000*
Chile, 1920	290,100	3,755,000*
Colombia, 1923	440,800	6,618,000*
Dutch Guiana, 1925	54,300	136,000
Ecuador, 1923	119,000*	2,000,000*
Falkland Islands, 1924	6,500	3,000*
French Guiana, 1921	34,700	44,000
Paraguay, 1917	98,000	1,000,000*
Peru, 1921	532,000	5,550,000*
Uruguay, 1924	72,200	1,640,000*
Venezuela, 1920	393,900	2,412,000
Europe	**3,671,200**	**452,979,000***
Albania, 1925	17,400	832,000*
Andorra, 1923	191	5,000
Austria, 1923	32,400	6,536,000
Belgium, 1925	11,800	7,744,000*
British Isles	121,800	47,363,000*
Great Britain	88,800	42,769,000
England	50,900	35,681,000
Wales	7,500	2,206,000
Scotland	30,400	4,882,000
Irish Free State, 1925	26,600	3,165,000*
Northern Ireland, 1924	6,100	1,279,000*
Other islands	300	150,000
Bulgaria, 1925	39,800	5,034,000*
Czechoslovakia, 1921	54,200	13,613,000
Danzig, 1924	754	386,000
Denmark, 1925	16,600	3,420,000
Estonia, 1925	18,400	1,111,000
Faroe Islands, 1921	540	21,000
Finland, 1924	132,600	3,495,000*
France, 1921	212,700	39,210,000
Corsica	3,400	282,000
Germany, 1925	181,200	62,539,000
Gibraltar, 1924	2	21,000
Greece, 1925	49,100	6,200,000*
Hungary, 1925	35,900	8,275,000*
Iceland, 1924	39,700	98,000*
Italy, 1925	119,600	42,116,000*
Italian Peninsula	100,400	37,190,000
Sardinia	9,300	864,000
Sicily	9,900	4,061,000
Latvia, 1925	25,000	1,845,000*
Liechtenstein, 1912	65	11,000
Lithuania, 1925	30,000	2,450,000*
Luxemburg, 1922	1,000	261,000
Malta, 1921	122	213,000
Monaco, 1913	8	23,000
Netherlands, The, 1925	13,200	7,315,000
Norway, 1920	125,000	2,650,000
Poland, 1921	149,900	30,000,000
Portugal, 1920	35,500	6,033,000
Portugal proper, 1920	34,300	5,622,000
The Azores, 1920	900	232,000
Madeira Islands, 1920	300	179,000
Rumania, 1925	122,300*	17,393,000
Union of Russian Republics, 1926	*1,592,800*	*102,536,000*
Russian Soviet Federation	1,376,000	72,273,000
Russia proper	862,700	54,904,000
North Caucasian Region	111,200	7,175,000
Ingushetia	1,200	69,000
Kabardin-Balkaria	4,700	149,000
Karatchay-Tcherkess	4,100	148,000
North Ossetia	2,500	137,000
Tcherkess	1,100	112,000
Tchetchen	4,000	310,000
Districts	93,600	6,250,000
Autonomous Territories		
Kalmyk	38,300	165,000
Komi (Syrians)	166,300	209,000
Mari	7,300	398,000
Votyak	11,200	710,000
Autonomous Republics		
Bashkiria	59,600	2,843,000
Crimea	9,900	626,000
Daghestan	22,700	806,000
Karelia	45,600	232,000
Tataria	25,500	626,000
Tchuvash	5,900	2,818,000
German Volga	9,800	761,000
Ukraine	174,000	25,808,000
Moldavia	3,012	546,000
White Russia	42,800	4,455,000
Saar Basin, 1921	750	658,000
San Marino, 1920	38	12,000
Spain, 1924	194,800	21,967,000
Spain proper, 1924	190,100	21,123,000
Balearic Islands, 1924	1,900	45,000
Canary Islands, 1924	2,800	499,000
Sweden, 1925	173,000	6,036,000
Switzerland, 1925	16,000	3,918,000*
Turkey in Europe, 1924	10,900	1,870,000*
Yugoslavia, 1920	96,100	12,017,000
Asia	**17,439,400**	**976,819,000***
Afghanistan, 1925	245,000	12,000,000*
Arabian Peninsula, 1925	1,000,000*	7,000,000
Aden, 1921	9,000	55,000
Nejd, 1925	370,000*	2,300,000*
Oman, 1925	82,000	500,000*
Yemen, 1925	75,000	2,500,000*
Remaining territory, 1925	464,000	1,645,000*
Bhutan, 1925	20,000	250,000
Borneo (British), 1921 (see also Dutch East Indies)	77,100*	883,000*
Ceylon, 1921	25,300	4,505,000
Chinese Republic, 1925	4,786,900*	396,762,000*
China proper	1,534,400*	375,000,000*

Countries

REFERENCE MAP OF THE
EASTERN METROPOLITAN AREA
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 10 20 30 40 50 60 70 80 90 100
National capital
State capitals
Railroads
Canals
HEIGHTS IN FEET
Over 3000
2000 to 3000
1000 to 2000
500 to 1000
100 to 500
Sea level to 100
Cities with 1,000,000 and over New York
Cities with 500,000 to 1,000,000 Boston
Cities with 100,000 to 500,000 Newark
Cities with 25,000 to 100,000 Lawrence
Cities with less than 25,000 Hornell
Large circles show 25 mile radii from City Halls
WILLIAMS ENGRAVING CO., N.Y.
ATLANTIC OCEAN
Longitude West from Greenwich
77° 76° 75° 74° 73° 72° 71°
42° 41° 40° 39°

Fig. 500

REFERENCE MAP OF THE
EAST NORTH CENTRAL STATES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 25 50 100 150 200
Important highways
Railroads
State capitals
Canals
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Cities with over 1,000,000 Chicago
Cities with 500,000 to 1,000,000 Detroit
Cities with 100,000 to 500,000 Toledo
Cities with 25,000 to 100,000 Dubuque
Smaller places Manistee
CANADA
MINNESOTA
WISCONSIN
MICHIGAN
ILLINOIS
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
LAKE ONTARIO
ISLE ROYAL
MICHIPICOTEN ISLAND
MANITOULIN ISLAND
Chicago
Detroit
Milwaukee
Cleveland
Toronto
Buffalo
Pittsburgh
Columbus
Indianapolis
Cincinnati
Louisville
St. Louis
Minneapolis
St. Paul
Duluth
Superior
Toledo
Grand Rapids
Akron
Youngstown
Dayton
Springfield
Fort Wayne
Evansville
Terre Haute
Peoria
Rockford
Madison
Green Bay
Kalamazoo
Saginaw
Flint
Port Huron
Sarnia
Hamilton
Kitchener
Windsor
Erie
Niagara Falls
Ohio R.
Mississippi R.
Missouri R.
Illinois R.
Wabash R.
Tennessee R.
Cumberland R.
Kentucky R.
Green R.
Wisconsin R.
Fox R.
Rock R.
Chippewa R.
Menominee R.
Escanaba
Marquette
Houghton
Calumet
Laurium
Ironwood
Rhinelander
Wausau
Oshkosh
Sheboygan
Manitowoc
Muskegon
Traverse City
Petoskey
Charlevoix
Cheboygan
Sault Ste. Marie
Mackinaw
Alpena
Bay City
Saginaw
Midland
Owen Sound
Collingwood
Barrie
Goderich
Guelph
Stratford
Brantford
Welland
Niagara
Rochester
Syracuse
Utica
Albany
Jamestown
Warren
Youngstown
Akron
Canton
Mansfield
Zanesville
Marietta
Parkersburg
Huntington
Charleston
Ashland
Ironton
Portsmouth
Gallipolis
Point Pleasant
Sutton
Richwood
Clarksburg
Fairmont
Morgantown
Wheeling
Steubenville
Cambridge
Newark
Lancaster
Chillicothe
Circleville
Xenia
Springfield
Middletown
Hamilton
Cincinnati
Covington
Newport
Lexington
Frankfort
Louisville
Bowling Green
Owensboro
Evansville
Vincennes
Terre Haute
Lafayette
Kokomo
Muncie
Anderson
Richmond
Connersville
Indianapolis
Columbus
Springfield
Dayton
Xenia
Hillsboro
Portsmouth
Ashland
Huntington
Charleston
Beckley
Princeton
Bluefield
Pikeville
Hazard
Jackson
Stanford
Danville
Harrodsburg
Shelbyville
Lawrenceburg
Madison
Seymour
Bloomington
Lawrenceville
Olney
Mt. Carmel
Centralia
Mt. Vernon
Carbondale
Cairo
Paducah
Hopkinsville
Princeton
Madisonville
Central City
Owensboro
Elizabethtown
Lebanon
Campbellsville
Somerset
London
Corbin
Barbourville
Pineville
Middlesboro
Bristol
Abingdon
Galax
Wytheville
Roanoke
Lynchburg
Charlottesville
Staunton
Harrisonburg
Winchester
Martinsburg
Cumberland
Hagerstown
Frederick
Baltimore
Washington
Annapolis
Philadelphia
Harrisburg
Williamsport
Scranton
Wilkes-Barre
Binghamton
Elmira
Corning
Hornell
Olean
Jamestown
Meadville
Titusville
Oil City
Franklin
Butler
Beaver Falls
New Castle
Sharon
Ashtabula
Conneaut
Fredonia
Dunkirk
Angola
Silver Creek
Lockport
Tonawanda
Welland
Port Colborne
Wellington Canal
Welland Canal
Erie Canal
Chicago Sanitary & Ship Canal
Illinois & Michigan Canal
Sturgeon Bay & Lake Michigan Canal
Portage Lake Ship Canal
Soo Canal
Mackinac Straits
Georgian Bay
Green Bay
Lake Michigan Elevation 581 feet
Lake Superior Elevation 603 feet
Lake Huron Elevation 580 feet
Lake Erie Elevation 573 feet
Lake Ontario Elevation 246 ft.
Longitude West 85° from Greenwich
89°
85°
81°
49°
45°
41°
37°
WILLIAMS ENGRAVING CO., N.Y.
1926

Fig. 501

Asia *(Continued)*

	Area in Square Miles	Population
Manchuria	364,000*	17,812,000*
Mongolia	1,875,000*	750,000*
Sinkiang	550,300*	1,200,000*
Tibet	463,200*	2,000,000*
Cyprus, 1921	3,600	311,000
Dutch East Indies, 1920	572,900	49,155,000
Borneo (Dutch)	206,800	1,626,000
Celebes	72,700	3,108,000
Java	50,700	34,984,000
New Guinea (see Islands of the Pacific)		
Sumatra, 1921	163,100	5,852,000
Other islands	79,600*	3,585,000
French India, 1924	196	278,000*
Hongkong (colony), 1924	391	800,000*
Indian Empire, 1921	1,805,300	318,942,000
Indian Peninsula, 1921	1,408,000	304,930,000
Baluchistan	134,600	800,000
Burma	262,700	13,212,000
Indo-China (including the Malay Peninsula), 1924	509,900	33,072,000
Federated Malay States	27,600	1,418,000*
French Indo-China	257,100	19,844,000
Non-federated Malay States	23,500	1,123,000
Siam	200,100	9,724,000
Straits Settlements	1,600	961,000
Iraq (Mesopotamia), 1925	143,300	2,849,000*
Japanese Empire, 1925	262,300	84,580,000*
Japan proper	148,800	59,936,000*
Chosen (Korea)	85,200	19,520,000*
Sakhalin	13,900	169,000*
Taiwan (Formosa)	13,900	3,976,000*
Kwantung (leased territory)	500	979,000*
Kerak (Trans-Jordan), 1925	unsettled	240,000*
Nepal, 1925	54,000	5,600,000*
Palestine, 1925	9,000*	757,000*
Persia, 1925	628,000	9,500,000*
Philippine Islands, 1918	115,000	10,314,000
Portuguese possessions (Goa, Macao, Timor, etc.)	9,000	1,001,000
Union of Russian Republics, 1926	*6,628,300*	*34,193,000*
Russian Soviet Federation	6,239,600	23,540,000
Ural Region[1]	675,700	6,312,000
Siberia	1,671,100	7,626,000
Altai	49,100	1,597,000
Irkutsk	326,000	750,000
Novo-Nikolayevsk	984,800	1,240,000
Omsk	55,600	1,309,000
Tomsk	96,600	1,599,000
Yenisei	158,800	1,131,000
Far East (Dalniy Vostok)	984,100	1,594,000
Amur	158,300	392,000
Kamchatka	485,100	32,000
Primorsk	226,300	635,000
Transbaikal	114,400	535,000
Autonomous Territories		
Kara-Kirgisia	91,100	793,000
Oyrat	36,500	83,000
Autonomous Republics		
Buryat-Mongolia	152,700	449,000
Kirgisia (Kasak)[1]	1,173,400	6,163,000
Kara-Kolpak	54,414	274,000
Yakutia	1,455,000	520,000
Transcaucasia	72,000	5,053,000
Azerbaijan	32,600	2,005,000
Nakhitchevan	2,317	77,000
Mountain Karabakh	1,621	131,000
Armenia	13,900	908,000
Georgia	25,500	2,140,000
Abkharistan		
Adsharistan		
South Ossetia		
Usbekistan	140,700	4,750,000
Turkmenistan	176,000	850,000
Syria, 1925	60,000	2,400,000*
Turkey in Asia, 1925	483,600*	11,487,000
Weihaiwei, 1921	285	154,000

[1] Partly in Europe

Australia, New Zealand, and Larger Islands of the Pacific

	Area in Square Miles	Population
Australia, 1925	**2,975,540**	**5,905,000***
Federal Territory	940	3,000
Northern Territory	523,600	23,000
New South Wales	310,400	2,257,000
Queensland	670,500	855,000
South Australia	380,100	543,000
Tasmania	26,200	214,000
Victoria	87,900	1,657,000
Western Australia	975,900	353,000
Bismarck Archipelago, 1922	16,000	176,000*
Fiji Islands, 1921	7,100	157,000
Guam, 1925	210	16,000
Hawaiian Islands, 1920	6,449	256,000
New Caledonia, 1911	7,700	51,000
New Guinea	319,700	821,000
British, 1925	159,000	626,000
Dutch, 1921	160,700	195,000
New Hebrides, 1923	5,700	60,000
New Zealand, 1925	105,000	1,382,000
Samoa Islands	1,277	46,000
American Samoa, 1922	77	8,000
Western Samoa, 1924	1,200	38,000
Solomon Islands, 1923	14,800	200,000*
Tonga (Friendly) Islands, 1921	385	25,000

Africa — **11,172,200** — **130,318,000***

	Area in Square Miles	Population
Independent countries		
Egypt, 1925	383,000	14,055,000*
Ethiopia (Abyssinia), 1925	350,000	10,000,000*
Liberia, 1925	43,000*	2,000,000*
Tangier (*neutral zone*)	140	52,000
Belgian Sphere of Influence		
Belgian Congo (Kongo), 1925	909,700	8,513,000
British Sphere of Influence		
Anglo-Egyptian Sudan, 1924	1,014,400	5,825,000
Basutoland, 1921	11,700	499,000
Bechuanaland Protectorate, 1921	275,000	153,000
British East Africa, 1924	688,300	9,961,000*
Kenia Colony and Protectorate	212,000	2,475,000*
Tanganyika Territory	365,000	4,124,000*
Uganda Protectorate	110,300	3,145,000*
Zanzibar (Island)	640	129,000
Pemba (Island)	380	88,000
British Somaliland Protectorate, 1923	68,000	344,000*
British West Africa, 1921	494,400	22,747,000*
Gambia and Protectorate	4,100	209,000*
Gold Coast and Protectorate	80,000	2,078,000
Cameroon (Kamerun) (British), 1923	31,000	660,000
Nigeria and Protectorate	335,700*	18,071,000
Sierra Leone and Protectorate	31,000	1,541,000
Togoland (British)	12,600	188,000
Nyasaland Protectorate, 1924	37,900	1,213,000*
Northern Rhodesia, 1921	291,000	1,111,000*
Southern Rhodesia, 1921	149,000	807,000*
Southwest Africa, 1921	322,800	228,000*
Swaziland, 1921	6,700	134,000
Union of South Africa, 1921	472,400	6,929,000
Cape of Good Hope	277,000	2,783,000
Natal	35,300	1,429,000
Orange Free State	49,600	629,000
Transvaal	110,500	2,088,000
French Sphere of Influence		
Algeria, 1922	222,200	5,806,000
Cameroon (Kamerun) (French), 1925	166,500	1,500,000*
French Equatorial Africa, 1921	982,000*	2,846,000*
French Somali Coast, 1921	5,800	208,000*
French West Africa and Sahara, 1921	1,886,400	12,666,000*
Dahomey	42,500	842,000*
French Guinea	92,600	2,026,000
French Sudan	648,500	2,500,000*
Ivory Coast	122,000	1,546,000*
Mauritania	347,400	285,000*
Senegal	74,100	1,226,000
Niger, 1924	404,900	1,222,000
Colony of the Upper Volta	154,400	3,019,000
Madagascar, 1925	228,700	3,471,000*
Morocco, 1921	222,800	5,400,000
Togoland (French), 1921	21,900	762,000*
Tunisia, 1921	48,300	2,095,000
Italian Sphere of Influence		
Eritrea, 1921	45,800	407,000
Italian Somaliland, 1923	187,000	662,000
Libia, 1922	580,000	800,000
Portuguese Sphere of Influence		
Angola (Port. West Africa), 1925	484,800	4,119,000*
Mozambique (Port. East Africa), 1924	428,100	3,210,000*
Cape Verde Islands	1,500	150,000
Other islands	400	60,000
Portuguese Guinea, 1923	13,900	800,000
Spanish Sphere of Influence		
Rio de Oro, 1925	109,200	495*
Spanish Guinea, etc., 1925	10,800	164,000
Spanish Morocco, 1925	7,700	600,000*
Ifni, 1925	965	20,000*

Antarctic Continent — **5,000,000**

TWENTY-FIVE LARGEST CITIES IN THE WORLD

	Population		Population		Population		Population
1. New York, U. S.	5,620,000	7. Tokyo, Japan	2,036,000*	14. Peking, China	1,300,000	20. Glasgow, Scotland	1,057,000*
2. London, England	4,485,000	8. Moscow, Russia	2,000,000	15. Osaka, Japan	1,253,000	21. Hamburg, Germany	1,054,000
3. Berlin, Germany	3,931,000	9. Vienna, Austria	1,866,000	16. Budapest, Hungary	1,185,000	22. Sydney, Australia	1,012,000
4. Paris, France	2,906,000	10. Philadelphia, U. S.	1,824,000	17. Bombay, India	1,176,000	23. Warsaw, Poland	1,000,000
5. Chicago, U. S.	2,702,000	11. Hankow, China	1,627,000*	18. Leningrad, Russia	1,164,000	24. Detroit, U. S.	994,000
6. Buenos Aires, Argentina	2,310,000	12. Shanghai, China	1,500,000	19. Rio de Janeiro, Brazil	1,158,000	25. Birmingham, England	919,000
		13. Calcutta, India	1,328,000				

UNITED STATES AND POSSESSIONS

State	Area in Square Miles	Population 1910	Population 1920
Alabama	52,000	2,138,000	2,348,000
Arizona	114,000	204,000	334,000
Arkansas	53,300	1,574,000	1,752,000
California	158,300	2,378,000	3,427,000
Colorado	103,900	799,000	940,000
Connecticut	5,000	1,115,000	1,381,000
Delaware	2,400	202,000	223,000
District of Columbia	70	331,000	438,000
Florida	58,700	753,000	968,000
Georgia	59,300	2,609,000	2,896,000
Idaho	83,900	326,000	432,000
Illinois	56,700	5,639,000	6,485,000
Indiana	36,400	2,701,000	2,930,000
Iowa	56,100	2,225,000	2,404,000
Kansas	82,200	1,691,000	1,769,000
Kentucky	40,600	2,290,000	2,417,000
Louisiana	48,500	1,656,000	1,799,000
Maine	33,000	742,000	768,000
Maryland	12,300	1,295,000	1,450,000
Massachusetts	8,300	3,366,000	3,852,000
Michigan	58,000	2,810,000	3,668,000
Minnesota	84,700	2,076,000	2,387,000
Mississippi	46,900	1,797,000	1,791,000
Missouri	69,400	3,293,000	3,404,000
Montana	147,000	376,000	549,000
Nebraska	77,500	1,192,000	1,296,000
Nevada	110,700	82,000	77,000
New Hampshire	9,300	431,000	443,000
New Jersey	8,200	2,537,000	3,156,000
New Mexico	122,600	327,000	360,000
New York	49,200	9,114,000	10,385,000
North Carolina	52,400	2,206,000	2,559,000
North Dakota	70,800	577,000	647,000
Ohio	41,000	4,767,000	5,759,000
Oklahoma	70,000	1,657,000	2,028,000
Oregon	96,700	673,000	783,000
Pennsylvania	45,100	7,665,000	8,720,000
Rhode Island	1,250	543,000	604,000
South Carolina	31,000	1,515,000	1,684,000
South Dakota	77,600	584,000	637,000
Tennessee	42,000	2,185,000	2,338,000
Texas	265,900	3,897,000	4,663,000
Utah	85,000	373,000	449,000
Vermont	9,600	356,000	352,000
Virginia	42,600	2,062,000	2,309,000
Washington	69,100	1,142,000	1,357,000
West Virginia	24,200	1,221,000	1,464,000
Wisconsin	56,100	2,334,000	2,632,000
Wyoming	97,900	146,000	194,000
United States (continental)	**3,027,000**	**91,972,000**	**105,711,000**
Outlying Possessions		9,174,000	12,149,000
Alaska	590,900	64,000	55,000
American Samoa	77	(1912) 7,000	8,000 (1922)
Guam	210	12,000	16,000 (1925)
Hawaii	6,449	192,000	256,000
Military and naval service abroad		56,000	117,000
Panama Canal Zone	554	(1912) 63,000	27,000 (1925)
Philippine Islands	115,000	(1903) 7,635,000	10,314,000 (1918)
Porto Rico	3,435	1,118,000	1,347,000 (1922)
Virgin Islands of the United States	132	(1911) 27,000	26,000 (1917)
United States (total)	**3,743,757**	**101,147,000**	**117,877,000**

GROWTH OF THE FIFTEEN LARGEST CITIES IN THE UNITED STATES

City	1920	1910	1900	1890	1830	1800
1. New York, N. Y.	5,620,000	4,767,000 (1)	3,437,000 (1)	2,507,000 (1)	203,000 (1)	61,000 (1)
2. Chicago, Ill.	2,702,000	2,185,000 (2)	1,699,000 (2)	1,100,000 (2)	4,000 (1840)	——
3. Philadelphia, Pa.	1,824,000	1,549,000 (3)	1,294,000 (3)	1,047,000 (3)	80,000 (3)	41,000 (2)
4. Detroit, Mich.	994,000	466,000 (9)	286,000 (13)	206,000 (14)	2,000 (23)	1,000 (1820)
5. Cleveland, Ohio	797,000	561,000 (6)	382,000 (8)	261,000 (10)	1,000 (24)	——
6. St. Louis, Mo.	773,000	687,000 (4)	575,000 (4)	452,000 (4)	16,000 (1840)	——
7. Boston, Mass.	748,000	671,000 (5)	561,000 (5)	448,000 (5)	61,000 (4)	25,000 (4)
8. Baltimore, Md.	734,000	558,000 (7)	509,000 (6)	434,000 (6)	81,000 (2)	27,000 (3)
9. Pittsburgh, Pa.	588,000	534,000 (8)	452,000 (7)	344,000 (7)	15,000 (11)	2,000 (10)
10. Los Angeles, Cal.	577,000	319,000 (17)	102,000 (34)	50,000 (44)	——	——
11. Buffalo, N. Y.	507,000	424,000 (10)	352,000 (9)	256,000 (11)	9,000 (15)	2,000 (1820)
12. San Francisco, Cal.	507,000	417,000 (11)	343,000 (10)	209,000 (8)	——	——
13. Milwaukee, Wis.	457,000	374,000 (12)	285,000 (14)	204,000 (15)	1,000 (1840)	——
14. Washington, D. C.	438,000	331,000 (16)	279,000 (15)	230,000 (13)	19,000 (8)	——
15. Newark, N. J.	415,000	347,000 (14)	246,000 (16)	182,000 (16)	11,000 (9)	8,000

CITIES OF THE UNITED STATES HAVING A POPULATION OF 25,000 OR OVER, INCLUDING THE CAPITAL AND LARGEST CITY OF EACH STATE

	Population 1910	Population 1920		Population 1910	Population 1920		Population 1910	Population 1920
Akron, Ohio	69,000	208,000	Auburn, N. Y.	35,000	36,000	Bellingham, Wash.	24,000	26,000
Alameda, Cal.	23,000	29,000	Augusta, Ga.	41,000	53,000	Berkeley, Cal.	40,000	56,000
Albany, N. Y.	100,000	113,000	Augusta, Me.	13,000	14,000	Bethlehem, Pa.	13,000	50,000
Albuquerque, N. M.	11,000	15,000	Aurora, Ill.	30,000	36,000	Binghamton, N. Y.	48,000	67,000
Allentown, Pa.	52,000	74,000	Austin, Tex.	30,000	35,000	Birmingham, Ala.	133,000	178,000
Altoona, Pa.	52,000	60,000	Baltimore, Md.	558,000	734,000	Bismarck, N. D.	5,000	7,000
Amsterdam, N. Y.	31,000	34,000	Bangor, Me.	25,000	26,000	Bloomington, Ill.	26,000	29,000
Anderson, Ind.	22,000	30,000	Baton Rouge, La.	15,000	22,000	Boise, Idaho	17,000	21,000
Annapolis, Md.	9,000	11,000	Battle Creek, Mich.	25,000	36,000	Boston, Mass.	671,000	748,000
Asheville, N. C.	19,000	29,000	Bay City, Mich.	45,000	48,000	Bridgeport, Conn.	102,000	144,000
Atlanta, Ga.	155,000	201,000	Bayonne, N. J.	56,000	77,000	Brockton, Mass.	57,000	66,000
Atlantic City, N. J.	46,000	51,000	Beaumont, Tex.	21,000	40,000	Brookline, Mass.	28,000	38,000

Cities with over 1,000,000 — London
Cities with 500,000 to 1,000,000 — Glasgow
Cities with 100,000 to 500,000 — Sheffield
Other places — Galway
ATLANTIC OCEAN
BRITISH ISLES
IRELAND
SCOTLAND
ENGLAND
WALES
NORTH SEA
ENGLISH CHANNEL
BAY OF BISCAY
FRANCE
SPAIN
PORTUGAL
SWITZERLAND
BELGIUM
NETHERLANDS
NORWAY
DENMARK
MEDITERRANEAN SEA
SHETLAND ISLANDS
ORKNEY IS.
CHANNEL ISLANDS
SCILLY IS.
London
Paris
Amsterdam
Rotterdam
The Hague
Brussels
Cologne
Frankfort
Marseille
Liverpool
Manchester
Birmingham
Glasgow
Edinburgh
Dublin
Belfast
Cork
Lisbon
Madrid
Barcelona
Bilbao
Oporto
Gibraltar
Longitude West 5° from Greenwich
Fig. 502

REFERENCE MAP OF
NORTHWESTERN EUROPE
PHYSICAL AND POLITICAL MAP
Scale of statute miles
0 50 100 200 300
Railroads
Canals
Capitals of countries
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
Longitude East from Greenwich
GULF OF BOTHNIA
GULF OF FINLAND
GULF OF RIGA
BALTIC SEA
ESTONIA
LATVIA
LITHUANIA
FINLAND
SWEDEN
NORWAY
DENMARK
GERMANY
POLAND
CZECHOSLOVAKIA
AUSTRIA
HUNGARY
YUGOSLAVIA
RUMANIA
BULGARIA
TURKEY
BLACK SEA
ADRIATIC SEA
WHITE RUSSIA
UKRAINE
MOLDAVIA
Moscow
Leningrad
Berlin
Warsaw
Prague
Vienna
Budapest
Riga
Kiev
Odessa
Stockholm
Helsingfors
Copenhagen
Oslo
Ladoga
Volga R.
Dnieper R.
Vistula R.
Danube R.
Pripet Marshes
Carpathian Mts.
Bohemian Forest
Alps
WILLIAMS ENGRAVING CO., N.Y.
1026

Fig. 502

	Population 1910	Population 1920
Buffalo, N. Y.	424,000	507,000
Burlington, Vt.	20,000	23,000
Butte, Mont.	39,000	42,000
Cambridge, Mass.	105,000	110,000
Camden, N. J.	95,000	116,000
Canton, Ohio	50,000	87,000
Carson City, Nev.	2,000	2,000
Cedar Rapids, Iowa	33,000	46,000
Charleston, S. C.	59,000	68,000
Charleston, W. Va.	23,000	40,000
Charlotte, N. C.	34,000	46,000
Chattanooga, Tenn.	45,000	58,000
Chelsea, Mass.	32,000	43,000
Chester, Pa.	39,000	58,000
Cheyenne, Wyo.	11,000	14,000
Chicago, Ill.	2,185,000	2,702,000
Chicopee, Mass.	25,000	36,000
Cicero, Ill.	15,000	45,000
Cincinnati, Ohio	364,000	401,000
Clarksburg, W. Va.	9,000	28,000
Cleveland, Ohio	561,000	797,000
Clifton, N. J.	12,000	26,000
Colorado Springs, Colo.	29,000	30,000
Columbia, S. C.	26,000	38,000
Columbus, Ga.	21,000	31,000
Columbus, Ohio	182,000	237,000
Concord, N. H.	21,000	22,000
Council Bluffs, Iowa	29,000	36,000
Covington, Ky.	53,000	57,000
Cranston, R. I.	21,000	29,000
Cumberland, Md.	22,000	30,000
Dallas, Tex.	92,000	159,000
Danville, Ill.	28,000	34,000
Davenport, Iowa	43,000	57,000
Dayton, Ohio	117,000	153,000
Decatur, Ill.	31,000	44,000
Denver, Colo.	213,000	256,000
Des Moines, Iowa	86,000	126,000
Detroit, Mich.	466,000	994,000
Dover, Del.	4,000	4,000
Dubuque, Iowa	38,000	39,000
Duluth, Minn.	78,000	99,000
East Chicago, Ind.	19,000	36,000
East Cleveland, Ohio	9,000	27,000
Easton Pa.	29,000	34,000
East Orange, N. J.	34,000	51,000
East St. Louis, Ill.	59,000	67,000
Elgin, Ill.	26,000	27,000
Elizabeth, N. J.	73,000	96,000
Elmira, N. Y.	37,000	45,000
El Paso, Tex.	39,000	78,000
Erie, Pa.	67,000	93,000
Evanston, Ill.	25,000	37,000
Evansville, Ind.	70,000	85,000
Everett, Mass.	33,000	40,000
Everett, Wash.	25,000	28,000
Fall River, Mass.	119,000	120,000
Fargo, N. D.	14,000	22,000
Fitchburg, Mass.	38,000	41,000
Flint, Mich.	39,000	92,000
Fort Smith, Ark.	24,000	29,000
Fort Wayne, Ind.	64,000	87,000
Fort Worth, Tex.	73,000	106,000
Frankfort, Ky.	10,000	10,000
Fresno, Cal.	25,000	45,000
Galveston, Tex.	37,000	44,000
Gary, Ind.	17,000	55,000
Grand Rapids, Mich.	113,000	138,000
Green Bay, Wis.	25,000	31,000
Greensboro, N. C.	15,900	44,000
Hagerstown, Md.	17,000	28,000
Hamilton, Ohio	35,000	40,000
Hammond, Ind.	21,000	36,000
Hamtramck, Mich.	4,000	49,000
Harrisburg, Pa.	64,000	76,000
Hartford, Conn.	99,000	138,000
Haverhill, Mass.	44,000	54,000
Hazleton, Pa.	25,000	32,000
Helena, Mont.	13,000	12,000
Highland Park, Mich.	4,000	46,000
Hoboken, N. J.	70,000	68,000
Holyoke, Mass.	58,000	60,000
Honolulu, Hawaii	52,000	83,000
Houston, Tex.	79,000	138,000
Huntington, W. Va.	31,000	50,000
Indianapolis, Ind.	234,000	314,000
Irvington, N. J.	12,000	25,000
Jackson, Mich.	31,000	48,000
Jackson, Miss.	21,000	23,000
Jacksonville, Fla.	58,000	92,000
Jamestown, N. Y.	31,000	39,000
Jefferson City, Mo.	12,000	14,000
Jersey City, N. J.	268,000	298,000
Johnstown, Pa.	55,000	67,000
Joliet, Ill.	35,000	38,000
Joplin, Mo.	32,000	30,000
Juneau, Alaska	2,000	3,000
Kalamazoo, Mich.	39,000	49,000
Kansas City, Kan.	82,000	101,000
Kansas City, Mo.	248,000	324,000
Kearny, N. J.	19,000	27,000
Kenosha, Wis.	21,000	40,000
Kingston, N. Y.	26,000	27,000
Knoxville, Tenn.	36,000	78,000
Kokomo, Ind.	17,000	30,000
La Crosse, Wis.	30,000	30,000
Lakewood, Ohio	15,000	42,000
Lancaster, Pa.	47,000	53,000
Lansing, Mich.	31,000	57,000
Lawrence, Mass.	86,000	94,000
Lewiston, Me.	26,000	32,000
Lexington, Ky.	35,000	42,000
Lima, Ohio	31,000	41,000
Lincoln, Neb.	44,000	55,000
Little Rock, Ark.	46,000	65,000
Long Beach, Cal.	18,000	56,000
Lorain, Ohio	29,000	37,000
Los Angeles, Cal.	319,000	577,000
Louisville, Ky.	224,000	235,000
Lowell, Mass.	106,000	113,000
Lynchburg, Va.	29,000	30,000
Lynn, Mass	89,000	99,000
McKeesport, Pa.	43,000	47,000
Macon, Ga.	41,000	53,000
Madison, Wis.	26,000	38,000
Malden, Mass.	44,000	49,000
Manchester, N. H.	70,000	78,000
Manila, P. I.	234,000	285,000
Mansfield, Ohio	21,000	28,000
Marion, Ohio	18,000	28,000
Medford, Mass.	23,000	39,000
Memphis, Tenn.	131,000	162,000
Meriden, Conn.	32,000	30,000
Meridian, Miss.	23,000	23,000
Miami, Fla.	5,000	30,000
Milwaukee, Wis.	374,000	457,000
Minneapolis, Minn.	301,000	381,000
Mobile, Ala.	52,000	61,000
Moline, Ill.	24,000	31,000
Montclair, N. J.	22,000	29,000
Montgomery, Ala.	38,000	43,000
Montpelier, Vt.	8,000	7,000
Mount Vernon, N. Y.	31,000	43,000
Muncie, Ind.	24,000	37,000
Muskegon, Mich.	24,000	37,000
Muskogee, Okla.	25,000	30,000
Nashua, N. H.	26,000	28,000
Nashville, Tenn.	110,000	118,000
Newark, N. J.	347,000	415,000
Newark, Ohio	25,000	27,000
New Bedford, Mass.	97,000	121,000
New Britain, Conn.	44,000	59,000
New Brunswick, N. J.	23,000	33,000
Newburgh, N. Y.	28,000	30,000
New Castle, Pa.	36,000	45,000
New Haven, Conn.	134,000	163,000
New London, Conn.	20,000	26,000
New Orleans, La.	339,000	387,000
Newport, Ky.	30,000	29,000
Newport, R. I.	27,000	30,000
Newport News, Va.	20,000	36,000
New Rochelle, N.Y.	29,000	36,000
Newton, Mass.	40,000	46,000
New York, N. Y.	4,767,000	5,620,000
Niagara Falls, N. Y.	30,000	51,000
Norfolk, Va.	67,000	116,000
Norristown, Pa.	28,000	32,000
Norwalk, Conn.	24,000	28,000
Oakland, Cal.	150,000	216,000
Oak Park, Ill.	19,000	40,000
Ogden, Utah	26,000	33,000
Oklahoma City, Okla.	64,000	91,000
Olympia, Wash.	7,000	8,000
Omaha, Neb.	124,000	192,000
Orange, N. J.	30,000	33,000
Oshkosh, Wis.	33,000	33,000
Pasadena, Cal.	30,000	45,000
Passaic, N. J.	55,000	64,000
Paterson, N. J.	126,000	136,000
Pawtucket, R. I.	52,000	64,000
Pensacola, Fla.	23,000	31,000
Peoria, Ill.	67,000	76,000
Perth Amboy, N. J.	32,000	42,000
Petersburg, Va.	24,000	31,000
Philadelphia, Pa.	1,549,000	1,824,000
Phoenix, Ariz.	11,000	29,000
Pierre, S. D.	4,000	3,000
Pittsburgh, Pa.	534,000	588,000
Pittsfield, Mass.	32,000	42,000
Plainfield, N. J.	21,000	28,000
Pontiac, Mich.	15,000	34,000
Port Huron, Mich.	19,000	26,000
Portland, Me.	59,000	69,000
Portland, Ore.	207,000	258,000
Portsmouth, Ohio	23,000	33,000
Portsmouth, Va.	33,000	54,000
Poughkeepsie, N. Y.	28,000	35,000
Providence, R. I.	224,000	238,000
Pueblo, Colo.	44,000	43,000
Quincy, Ill.	37,000	36,000
Quincy, Mass.	33,000	48,000
Racine, Wis.	38,000	59,000
Raleigh, N. C.	19,000	27,000
Reading, Pa.	96,000	108,000
Reno, Nev.	11,000	12,000
Revere, Mass.	18,000	29,000
Richmond, Ind.	22,000	27,000
Richmond, Va.	128,000	172,000
Roanoke, Va.	35,000	51,000
Rochester, N. Y.	218,000	296,000
Rockford, Ill.	45,000	66,000
Rock Island, Ill.	24,000	35,000
Rome, N. Y.	20,000	26,000
Sacramento, Cal.	45,000	66,000
Saginaw, Mich.	51,000	62,000
St. Joseph, Mo.	77,000	78,000
St. Louis, Mo.	687,000	773,000
St. Paul, Minn.	215,000	235,000
St. Thomas, V. I.	—	8,000
Salem, Mass.	44,000	43,000
Salem, Ore.	14,000	18,000
Salt Lake City, Utah	93,000	118,000
San Antonio, Tex.	97,000	161,000
San Diego, Cal.	40,000	75,000
San Francisco, Cal.	417,000	507,000
San Jose, Cal.	29,000	40,000
San Juan, P. R.	49,000	71,000
Santa Fé, N. M.	5,000	7,000
Savannah, Ga.	65,000	83,000
Schenectady, N. Y.	73,000	89,000
Scranton, Pa.	130,000	138,000
Seattle, Wash.	237,000	315,000
Sheboygan, Wis.	26,000	31,000
Shreveport, La.	28,000	44,000
Sioux City, Iowa	48,000	71,000
Sioux Falls, S. D.	14,000	25,000
Somerville, Mass.	77,000	93,000
South Bend, Ind.	54,000	71,000
Spokane, Wash.	104,000	104,000
Springfield, Ill.	52,000	59,000
Springfield, Mass.	89,000	130,000
Springfield, Mo.	35,000	40,000
Springfield, Ohio	47,000	61,000
Stamford, Conn.	29,000	35,000
Steubenville, Ohio	22,000	29,000
Stockton, Cal.	23,000	40,000
Superior, Wis.	40,000	40,000
Syracuse, N. Y.	137,000	172,000
Tacoma, Wash.	84,000	97,000
Tallahassee, Fla.	5,000	6,000
Tampa, Fla.	38,000	52,000
Taunton, Mass.	34,000	37,000
Terre Haute Ind.	58,000	66,000
Toledo, Ohio	168,000	243,000
Topeka, Kan.	44,000	50,000
Trenton, N. J.	97,000	119,000
Troy, N. Y.	77,000	72,000
Tulsa, Okla.	18,000	72,000
Utica, N. Y.	74,000	94,000
Waco, Tex.	26,000	39,000
Waltham, Mass.	28,000	31,000
Warren, Ohio	11,000	27,000
Washington, D. C.	331,000	438,000
Waterbury, Conn.	73,000	92,000
Waterloo, Iowa	27,000	36,000
Watertown, N. Y.	27,000	31,000
West Hoboken, N. J.	35,000	40,000
West New York, N. J.	14,000	30,000
Wheeling, W. Va.	42,000	56,000
Wichita, Kan.	52,000	72,000
Wichita Falls, Tex.	8,000	40,000
Wilkes-Barre, Pa.	67,000	74,000
Williamsport, Pa.	32,000	36,000
Wilmington, Del.	87,000	110,000
Wilmington, N. C.	26,000	33,000
Winston-Salem, N. C.	23,000	48,000
Woonsocket, R. I.	38,000	43,000
Worcester, Mass.	146,000	180,000
Yonkers, N. Y.	80,000	100,000
York, Pa.	45,000	48,000
Youngstown, Ohio	79,000	132,000
Zanesville, Ohio	28,000	30,000

FOREIGN CITIES

		Population
Aberdeen, Scotland	1925	159,000
Addis Ababa, Ethiopia	1925	66,000*
Adelaide, South Australia	1924	290,000
Aden (colony), Aden, Arabia	1925	46,000
Adrianople, Turkey	1924	56,000
Agra, India	1921	186,000
Agram, Yugoslavia	1921	108,000
Ahmedabad, India	1921	274,000
Aleppo, Syria	1920	140,000
Alexandria, Egypt	1917	445,000
Algiers, Algeria	1922	207,000
Allahabad, India	1921	157,000
Amiens, France	1921	93,000
Amoy, China	1924	300,000
Amritsar, India	1921	160,000
Amsterdam, The Netherlands	1925	712,000
Angora, Turkey	1923	35,000
Antwerp, Belgium	1925	302,000
Arequipa, Peru	1925	55,000
Astrakhan, Kalmyk, Russia	1913	123,000
Asuncion, Paraguay	1920	100,000*
Athens, Greece	1920	385,000*
Auckland, New Zealand	1925	181,000
Baghdad, Iraq	1920	170,000
Bahia (São Salvador), Brazil	1920	283,000
Bahia Blanca, Argentina	1925	44,000
Baile Atha Cliath, see Dublin		
Baku, Azerbaijan	1923	250,000
Bangalore, India	1921	237,000
Bangkok, Siam	1923	746,000*
Barcelona, Spain	1925	738,000
Barranquilla, Colombia	1923	65,000
Basel, Switzerland	1924	137,000
Batavia, Java	1925	254,000*
Beirut, Syria	1923	80,000*
Belem, see Para		
Belfast, Northern Ireland	1924	434,000*
Belgrade, Yugoslavia	1921	112,000
Belize, British Honduras	1921	13,000
Benares, India	1921	198,000
Berlin, Germany	1925	3,931,000
Bern, Switzerland	1924	105,000
Bilbao, Spain	1925	143,000
Birmingham, England	1921	919,000
Bogota, Colombia	1923	166,000*
Bokhara, Usbekistan	1923	75,000*
Bologna, Italy	1924	218,000*
Bombay, India	1921	1,176,000
Bordeaux, France	1921	267,000
Boulogne, France	1921	68,000
Bradford, England	1921	286,000
Bremen, Germany	1925	290,000
Breslau, Germany	1925	553,000
Brest, France	1921	74,000
Brisbane, Queensland, Australia	1924	245,000
Bristol, England	1921	377,000
Brno, see Brunn		
Bruges, Belgium	1925	53,000
Brunn (Brno), Czechoslovakia	1921	222,000
Brussa, Turkey	1924	65,000
Brussels, Belgium	1925	794,000
Bucharest, Rumania	1917	309,000
Budapest, Hungary	1921	1,185,000
Buenos Aires, Argentina	1925	2,310,000
Cadiz, Spain	1925	78,000
Cairo, Egypt	1917	791,000
Calcutta, India	1921	1,328,000
Calgary, Alberta, Canada	1921	63,000
Callao, Peru	1925	60,000
Cambridge, England	1921	59,000
Canton, China	1924	900,000
Cape Town, Union of S. Africa	1921	207,000
Caracas, Venezuela	1920	92,000
Cardiff, Wales	1924	226,000
Catania, Italy	1924	258,000*
Cawnpore, India	1921	216,000
Cayenne, French Guiana	1921	10,000
Changsha, China	1924	536,000
Charleroi, Belgium	1925	27,000
Charlottetown, Prince Edward Island, Canada	1921	12,000
Chemnitz, Germany	1925	323,000
Cholon, French Indo-China	1921	234,000
Chungking, China	1924	593,000
Cologne, Germany	1925	693,000
Colombo, Ceylon	1921	244,000
Colon, Panama	1920	31,000
Constantinople, Turkey	1924	881,000*
Copenhagen, Denmark	1925	586,000
Cordoba, Argentina	1918	156,000
Cordoba, Spain	1925	78,000
Dairen, Kwantung, China	1924	181,000*
Damascus, Syria	1925	170,000*
Danzig, Free City of Danzig	1924	207,000
Dawson, Yukon, Canada	1921	1,000
Delhi, India	1921	304,000
Dortmund, Germany	1925	320,000
Douglas, Isle of Man	1924	20,000
Dresden, Germany	1925	608,000
Dublin (Baile Atha Cliath), Irish Free State	1925	438,000*
Duisburg, Germany	1925	272,000
Dundee, Scotland	1925	172,000
Durban, Union of S. Africa	1921	146,000
Düsseldorf, Germany	1925	429,000
Edinburgh, Scotland	1925	427,000
Edmonton, Alberta, Canada	1921	59,000
Erivan, Armenia	1923	90,000
Erzerum, Turkey	1923	43,000
Essen, Germany	1925	466,000
Fez, Morocco	1924	125,000
Fiume, Italy	1924	45,000*
Florence, Italy	1924	261,000*
Foochow, China	1924	315,000
Frankfort, Germany	1925	458,000
Funchal, Madeira Islands	1925	60,000
Gelsenkirchen, Germany	1925	206,000
Geneva, Switzerland	1924	128,000
Genoa, Italy	1924	323,000*
Georgetown, British Guiana	1924	56,000
Ghent, Belgium	1925	164,000
Glasgow, Scotland	1925	1,057,000*
Göteborg, Sweden	1925	230,000
Granada, Spain	1925	106,000
Guadalajara, Mexico	1925	130,000
Guatemala, Guatemala	1921	116,000*
Guayaquil, Ecuador	1923	100,000
Habana, see Havana		
Hague, The, The Netherlands	1924	391,000
Halifax, Nova Scotia, Canada	1921	58,000
Hamburg, Germany	1925	1,054,000
Hamilton, Bermuda Islands	1925	3,000
Hamilton, Ontario, Canada	1921	114,000
Hangchow, China	1924	340,000*
Hankow, China	1924	1,627,000*
Hanover, Germany	1925	414,000
Harbin, China	1924	166,000
Havana (Habana), Cuba	1924	539,000
Havre, France	1921	163,000
Helsingfors, Finland	1924	208,000
Herat, Afghanistan	1925	121,000
Hobart, Tasmania	1925	56,000
Hull, England	1921	287,000
Hyderabad, India	1921	404,000
Irkutsk, Irkutsk, Russia	1925	88,000
Jedda, Nejd, Arabia	1925	20,000
Jerusalem, Palestine	1922	63,000
Johannesburg, Union of S. Africa	1921	288,000*
Johore Bharu, Non-federated Malay States	1925	15,000*
Kabul, Afghanistan	1925	100,000*
Karachi, India	1921	217,000*
Katmandu, Nepal	1925	80,000*
Kaunas, see Kovno		
Kazan, Tataria, Russia	1913	195,000
Kharkof, Ukraine	1923	250,000*
Khartum, Anglo-Egyptian Sudan	1924	31,000
Kief, Ukraine	1923	404,000
Kiel, Germany	1925	212,000
Kimberley, Union of S. Africa	1921	40,000
Kingston, Jamaica	1921	63,000
Kobe, Japan	1920	609,000
Konia, Turkey	1924	71,000
Königsberg, Germany	1925	275,000
Kovno (Kaunas), Lithuania	1925	92,000*
Krakow, Poland	1926	200,000
Kuala Lumpur, Federated Malay States	1924	80,000*
Kyoto, Japan	1920	591,000
Lahore, India	1921	282,000
La Paz, Bolivia	1924	118,000*
La Plata, Argentina	1922	151,000
Leeds, England	1921	458,000
Leghorn, Italy	1924	119,000
Leicester, England	1921	234,000
Leipzig, Germany	1925	660,000
Lemberg (Lwow), Poland	1926	250,000
Leningrad, Russia	1924	1,164,000
León, Nicaragua	1925	47,000
Libreville, Fr. Equatorial Africa	1921	4,000
Liège, Belgium	1925	167,000
Lille, France	1921	201,000
Lima, Peru	1925	190,000*
Limoges, France	1921	90,000
Lisbon, Portugal	1920	486,000
Liverpool, England	1921	803,000
Lodz, Poland	1926	500,000
London, England	1921	4,485,000
Louvain, Belgium	1925	41,000
Lucknow, India	1921	241,000
Luxembourg, Luxemburg	1922	48,000
Lwow, see Lemberg		
Lyon, France	1921	562,000
Madras, India	1921	527,000
Madrid, Spain	1925	783,000*
Magdeburg, Germany	1925	287,000
Malaga, Spain	1925	157,000
Malmo, Sweden	1925	116,000
Managua, Nicaragua	1925	60,000
Manaos, Brazil	1920	76,000
Manchester, England	1921	730,000
Mandalay, Burma	1921	149,000
Mannheim, Germany	1925	242,000
Marrakesh, see Morocco		
Marseille, France	1921	586,000
Maskat, Oman, Arabia	1925	20,000*
Mecca, Nejd, Arabia	1925	60,000*
Mechlin, Belgium	1925	60,000
Medellin, Colombia	1923	79,000
Melbourne, Victoria, Australia	1925	886,000
Mendoza, Argentina	1925	59,000
Messina, Italy	1924	182,000*
Metz, France	1921	62,000
Mexico City, Mexico	1923	633,000
Milan, Italy	1924	853,000
Minsk, White Russia	1925	105,000
Mombasa, British E. Africa	1924	40,000
Monrovia, Liberia	1925	10,000*
Montevideo, Uruguay	1925	422,000
Montreal, Quebec, Canada	1925	908,000
Morocco (Marrakesh), Morocco	1924	145,000
Moscow, Russia	1926	2,000,000
Mozambique, Mozambique	1925	363,000
Munich, Germany	1925	672,000
Murcia, Spain	1925	148,000
Nagasaki, Japan	1920	177,000
Nagoya, Japan	1920	430,000
Nancy, France	1921	113,000
Nanking, China	1924	396,000
Nantes, France	1921	184,000
Naples, Italy	1924	784,000*
Nassau, Bahama Islands	1925	13,000
Newcastle, England	1921	275,000
Nice, France	1924	156,000
Ningpo, China	1924	284,000
Nish, Yugoslavia	1921	25,000
Nottingham, England	1921	263,000
Nuremberg, Germany	1925	384,000
Odessa, Ukraine	1923	317,000
Omdurman, Anglo-Egyptian Sudan	1924	79,000
Omsk, Omsk, Russia	1925	143,000
Oporto, Portugal	1920	203,000
Orenburg, Kirgisia, Russia	1925	106,000
Osaka, Japan	1920	1,253,000
Oslo, Norway	1920	258,000
Ostend, Belgium	1925	41,000
Ottawa, Ontario, Canada	1921	108,000
Oxford, England	1921	57,000
Palermo, Sicily	1924	405,000*
Panama, Panama	1920	59,000
Para (Belem), Brazil	1920	236,000
Paramaribo, Dutch Guiana	1925	46,000
Paris, France	1921	2,906,000
Peking, China	1921	1,300,000
Pernambuco (Recife), Brazil	1920	239,000
Perth, Western Australia	1925	148,000
Piræus, Greece	1920	133,000
Plymouth, England	1921	210,000
Pnompenh, French Indo-China	1924	90,000
Poona, India	1921	215,000
Port au Prince, Haiti	1924	125,000
Porto Alegre, Brazil	1920	179,000
Port of Spain, Trinidad	1924	64,000
Port Said, Egypt	1917	91,000
Portsmouth, England	1921	247,000
Posen (Poznan), Poland	1926	200,000
Poznan, see Posen		
Prague (Praha) Czechoslovakia	1921	677,000
Praha, see Prague		
Pretoria, Union of S. Africa	1921	74,000
Pueblo, Mexico	1925	125,000
Punakha, Bhutan	1925	5,000
Quebec, Quebec, Canada	1921	95,000
Quetta, Baluchistan	1921	49,000*

HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Below sea level
Cities with over 500,000 ..... Marseille
Cities with 100,000 to 500,000 ..... Bordeaux
Other places ..... Bayonne
REFERENCE MAP OF THE
WESTERN MEDITERRANEAN COUNTRIES
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300
Railroads
Canals
Capitals of countries
Longitude West from Greenwich
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.
ATLANTIC OCEAN
BISCAY
BAY OF
FRANCE
SWITZERLAND
AUSTRIA
HUNGARY
YUGOSLAVIA
ADRIATIC SEA
ITALIAN PENINSULA
CORSICA (Fr.)
SARDINIA
SICILY
MALTA (Br.)
IBERIAN PENINSULA
SPAIN
PORTUGAL
MEDITERRANEAN SEA
BALEARIC (Spanish) ISLES
MINORCA
MAJORCA
IVIZA
ALGERIA
(French)
SOUTHERN ALGERIA
MOROCCO
(French)
SPANISH ZONE
Strait of Gibraltar
Strait of Messina
Gulf of Lyon
Gulf of Genoa
Gulf of Tunis
Gulf of Gabes
Gulf of Salerno
Gulf of Squillace
Gulf of Gallipoli
Strait of Otranto
Strait of Bonifacio
Marseille
Toulon
Nice
Monaco
Genoa
Milan
Turin
Venice
Trieste
Rome
Naples
Barcelona
Madrid
Lisbon
Oporto
Seville
Granada
Malaga
Valencia
Palma
Algiers
Oran
Tunis
Bizerta
Bone
Constantine
Biskra
Tripoli
Malta
Valetta
Gibraltar (Br.)
Tangier
Ceuta
Tetuan
Fez
Rabat
Casablanca
Tafilelt
Figig
Tuggurt
Berresof
Gardaia
Laghuat
Geriville
Messad
Shat Melghir
Shat el Jerid
Mt. Etna
10,755 ft.
Mt. Vesuvius
4360 ft.
Mt. Blanc
15,732 ft.
Mt. Cenis
Mt. Pardo Maladetta
Mt. Aigoual
Mt. Viso
Mt. Cervin
Mt. Rosa
Mt. Gothard Pass
Simplon Pass
Mont Cenis Pass
St. Bernard Pass
Brenner Pass
Pyrenees Mts.
Cevennes Mts.
Juras Mts.
Alps
Dinaric Alps
Apennines
Great Atlas Mts.
Lesser Atlas Mts.
Sahara
Plateau of Central Spain
Plateau of Northern Algeria
Sierra Morena
Sierra Nevada
Cantabrian Mts.
Andalusian Mts.
Aures Mts.
Kabylie Mts.
Balearic Is.
Lipari or Aeolian Is.
Aegadian Is.
Pantelleria I. (It.)
Kerkenna Is.
Jerba I.
Corsica (Fr.)
Sardinia
Ajaccio
Bastia
Leghorn
Pisa
Florence
Ancona
Naples
Palermo
Messina
Catania
Syracuse
Trapani
Marsala
Tunis
Bizerta
Bone
Philippeville
Algiers
Oran
Mostaganem
Arzew
Mers-el-Kebir
Oran
Tlemcen
Nemours
Melilla
Ceuta
Gibraltar (Br.)
Tangier
Tetuan
Rabat
Casablanca
Mogador
Agadir
Mazagan
Safi
Mogador
Fez
Mequinez
Tasa
Fekkus
Debdu
Ujda
Figuig
Erfala
Tafilelt
Sidi-bel-Abbes
Saida
Frenda
Tiaret
Mascara
Orleansville
Miliana
Blida
Aumale
Bougie
Setif
Souk Ahras
Bona
La Calle
Guelma
Batna
Biskra
Kairwan
Sousa
Monastir
Mahares
Sfax
Feriana
Gafsa
Nefta
Kebili
Sarsis
Duz
Kasr Medenin
Duirat
Dehibat
Wargla
Tuggurt
Berresof
Gardaia
Laghuat
Geriville
Messad
Shat Melghir
Shat el Jerid
Figig
Tafilelt
Erfala
Debdu
Fekkus
Mekinez
Mediuna
Settat
Casablanca
Rabat
Fez
Tasa
Ujda
Melilla
Nemours
Mehediah
Wesan
Arsila
El Araish
Badis
Tershuan
Tetuan
Ceuta
Gibraltar (Br.)
Tangier
Strait of Gibraltar
(Neutral Zone)
Algeciras
Tarifa
Cadiz
Gulf of Cadiz
Sanlucar
Jerez
Seville
Antequera
Malaga
Velez Malaga
Almunecar
Almeria
Motril
Granada
Lucena
Jaen
Cordoba
Belmez
Sierra Morena
Badajoz
Merida
Elvas
Portalegre
Setubal
Evora
Beja
Jerez
Huelva
Lagos
Faro
Tavira
Ayamonte
Guadiana R.
Guadalquivir R.
Tagus R.
Douro R.
Ebro R.
Segre R.
Garonne R.
Dordogne R.
Loire R.
Rhone R.
Saone R.
Seine R.
Po R.
Arno R.
Tiber R.
Volturno R.
Garigliano R.
Adige R.
Piave R.
Tagliamento R.
Isonzo R.
Drave R.
Save R.
Danube R.
Aare R.
Rhine R.
Inn R.
Salzach R.
Traun R.
Enns R.
Mur R.
Drau R.
Sava R.
Vardar R.
Maritza R.
Struma R.
Vistula R.
Oder R.
Elbe R.
Moldau R.
Weser R.
Ems R.
Meuse R.
Scheldt R.
Somme R.
Seine R.
Loire R.
Garonne R.
Dordogne R.
Gironde R.
Adour R.
Ebro R.
Segre R.
Douro R.
Tagus R.
Guadiana R.
Guadalquivir R.
Guadalete R.
Guadiana R.
Guadalquivir R.
Guadalete R.
Tagus R.
Douro R.
Ebro R.
Segre R.
Garonne R.
Dordogne R.
Loire R.
Rhone R.
Saone R.
Seine R.
Po R.
Arno R.
Tiber R.
Volturno R.
Garigliano R.
Adige R.
Piave R.
Tagliamento R.
Isonzo R.
Drave R.
Save R.
Danube R.
Aare R.
Rhine R.
Inn R.
Salzach R.
Traun R.
Enns R.
Mur R.
Drau R.
Sava R.
Vardar R.
Maritza R.
Struma R.
Vistula R.
Oder R.
Elbe R.
Moldau R.
Weser R.
Ems R.
Meuse R.
Scheldt R.
Somme R.

Fig. 503

REFERENCE MAP OF THE
COUNTRIES OF THE
DANUBE AND THE BALKANS
POLITICAL AND PHYSICAL MAP
Scale of statute miles
0 50 100 200 300
Railroads
Canals
Capitals of countries
HEIGHTS IN FEET
Over 10,000
5000 to 10,000
2000 to 5000
1000 to 2000
500 to 1000
Sea level to 500
Cities with over 1,000,000 Constantinople
Cities with 500,000 to 1,000,000 Budapest
Cities with 100,000 to 500,000 Lemberg
Other places Brusa
WILLIAMS ENGRAVING CO., N.Y.
Longitude East from Greenwich
AUSTRIA
HUNGARY
CZECHO-SLOVAKIA
POLAND
UNION OF SOVIET SOCIALIST REPUBLICS
RUSSIAN
RUMANIA
YUGOSLAVIA
BULGARIA
ALBANIA
GREECE
TURKEY IN ASIA
Prague
Vienna
Budapest
Munich
Constantinople
Rome
Naples
Athens
Sofia
Belgrade
Bucharest
Odessa
Lemberg
Trieste
Venice
Danube R.
Black Sea
Aegean Sea
Ionian Sea
Tyrrhenian Sea
Adriatic Sea
Mediterranean Sea
Sea of Marmora
Carpathian Mts.
Alps Mts.
Balkan Mts.
Dinaric Alps
Apennines
Sicily
Malta I. (Br.)
Crete
Rhodes
Cyprus
Longitude East from Greenwich

Fig. 504

		Population
Quito, Ecuador	1923	81,000
Rangoon, Burma, India	1921	342,000
Recife, see Pernambuco		
Regina, Saskatchewan, Canada	1921	34,000
Reims, France	1921	77,000
Reval (Tallinn), Estonia	1924	130,000*
Reykjavik, Iceland	1924	21,000
Riga, Latvia	1925	338,000
Rio de Janeiro, Brazil	1920	1,158,000
Rome, Italy	1925	747,000
Rosario, Argentina	1922	265,000
Rotterdam, The Netherlands	1924	544,000
Roubaix, France	1921	113,000
Rouen, France	1921	124,000
St. Étienne, France	1921	168,000
St. John, New Brunswick, Canada	1921	47,000
St. John's, Newfoundland	1924	39,000
Salford, England	1921	234,000
Salisbury, Southern Rhodesia	1921	6,000
Saloniki, Greece	1923	263,000
San'a, Yemen, Arabia	1925	25,000*
San José, Costa Rica	1924	42,000*
San Luis Potosi, Mexico	1925	85,000
San Salvador, Salvador	1924	84,000*
Santa Fé, Argentina	1925	60,000
Santiago, Chile	1920	507,000
Santo Domingo, Dominican Rep.	1921	31,000
São Paulo, Brazil	1920	579,000
São Salvador, see Bahia		
Saragossa, Spain	1925	148,000
Scutari, Albania	1925	32,000*
Seoul, Chosen	1925	297,000
Seville, Spain	1925	211,000
Shanghai, China	1924	1,500,000
Sheffield, England	1921	491,000
Singapore, Straits Settlements	1924	350,000*
Smyrna, Turkey	1924	99,000*
Sofia, Bulgaria	1920	154,000
Soochow, China	1924	500,000
Southampton, England	1921	161,000
Stanley, Falkland Islands	1921	900
Stettin, Germany	1925	251,000
Strasbourg, France	1921	167,000
Stockholm, Sweden	1925	439,000
Stoke-on-Trent, England	1921	240,000
Stuttgart, Germany	1925	337,000
Sucre, Bolivia	1924	216,000*
Sydney, Australia	1925	1,012,000*
Sydney, Nova Scotia, Canada	1921	23,000
Tabriz, Persia	1925	180,000*
Taihoku, Taiwan	1922	180,000
Tallinn, see Reval		
Tananarive, Madagascar	1925	69,000
Tashkent, Usbekistan, Russia		75,000*
Tegucigalpa, Honduras	1921	39,000*
Teheran, Persia	1925	350,000*
Tientsin, China	1924	800,000
Tiflis, Georgia	1915	347,000
Tobolsk, Ural, Russia	1913	25,000
Tokyo, Japan	1925	2,036,000*
Tomsk, Tomsk, Russia	1925	90,000
Toronto, Ontario, Canada	1921	522,000
Toulon, France	1921	106,000
Toulouse, France	1921	175,000
Tournai, Belgium	1925	36,000
Trebizond, Turkey	1923	55,000
Trieste, Italy	1924	239,000*
Tripoli, Libia	1922	60,000*
Tsingtao, China	1924	273,000
Tucuman, Argentina	1925	91,000
Tunis, Tunisia	1921	172,000
Turin, Italy	1924	508,000*
Utrecht, The Netherlands	1924	150,000
Valencia, Spain	1925	260,000
Valparaiso, Chile	1920	182,000
Vancouver, British Columbia, Canada	1921	117,000
Venice, Italy	1924	200,000*
Vera Cruz, Mexico	1923	40,000
Victoria, British Columbia, Canada	1921	39,000
Victoria, Hongkong	1924	420,000
Vienna, Austria	1923	1,866,000
Vilna (Wilno), Poland	1926	150,000
Vladivostok, Primorsk, Russia	1922	195,000
Warsaw, Poland	1926	1,000,000
Wenchaw, China	1924	202,000
West Ham, England	1921	301,000
Wilno, see Vilna		
Winnipeg, Manitoba, Canada	1921	179,000
Yokohama, Japan	1920	423,000
Zurich, Switzerland	1924	205,000

ELEVATION OF SOME PLATEAUS AND MOUNTAIN PEAKS

	Feet
Abyssinian Plateau	5,000–7,000
Aconcagua, Andes, Argentina (highest in South America)	22,860
Apo, Mindanao, Philippines	10,311
Ararat, Armenia	16,910
Mt. Blanc, Alps, France (highest in Alps)	15,782
Bolivian Plateau	10,000–13,000
Brazilian Highlands	2,000–2,500
Chimborazo, Andes, Ecuador	20,498
Cotopaxi, Andes, Ecuador	19,613
Elbruz, Caucasus, Russia (highest in Europe)	18,525
Etna, Sicily	10,755
Everest, Himalayas, Nepal (highest in the world)	29,002
Fuji, Japan	12,365
Hekla, Iceland	5,110
Kanchanjanga (Himalayas)	28,225
Kenia, Africa	18,373
Kilimanjaro, Africa (highest in Africa)	19,710
Kosciusko, Australia (highest in Australia)	7,308
Lassen, Sierra Nevada, California	10,465
Logan, Coast Ranges, Canada (highest in Canada)	19,850
McKinley, Alaska (highest in North America)	20,300
Mauna Kea, Hawaiian Islands	13,825
Mauna Loa, Hawaiian Islands	13,675
Mayon, Luzon Island, Philippines	8,300
Mexican Plateau	5,000–6,000
Mitchell, Appalachian Highland, N. C. (highest in eastern U. S.)	6,711
Mt. Marcy, New York	5,344
Orizaba, Mexico (highest in Mexico)	18,701
Pikes Peak, Rocky Mountains, Colorado	14,110
Popocatepetl, Mexico	17,888
Rainier (Tacoma), Cascade Range, Washington	14,408
St. Elias, Alaska	18,000
San Francisco Mountain, Arizona	12,611
Shasta, Cascade Range, California	14,161
Tibet Plateau	10,000–15,000
United States, Western Plateau	4,000–6,000
Vesuvius, Italy	4,360
Washington, White Mountains, N. H. (highest in northeastern U. S.)	6,293
Whitney, Sierra Nevada, California (highest in continental U. S.)	14,510

SOME OF THE LARGEST RIVERS OF THE WORLD

North America	Length in Miles	Basin Area Sq. Miles	Ocean
Arkansas	2,200	186,000	Atlantic
Colorado	2,000	225,000	Pacific
Columbia	1,400	217,000	Pacific
Mackenzie	2,000	590,000	Arctic
Missouri	3,000	527,000	Atlantic
Missouri-Mississippi	4,300	1,257,000	Atlantic
Nelson	1,700	432,000	Atlantic
Ohio	1,000	202,000	Atlantic
Rio Grande	1,800	240,000	Atlantic
St. Lawrence	2,200	530,000	Atlantic
Yukon	2,000	440,000	Pacific
South America			
Amazon	3,300	2,500,000	Atlantic
Orinoco	1,300	366,000	Atlantic
Plata	2,200	1,200,000	Atlantic
São Francisco	1,800	200,000	Atlantic
Europe			
Danube	1,800	300,000	Atlantic
Dnieper	1,200	242,000	Atlantic
Dwina	1,000	140,000	Arctic
Elbe	700	55,000	Atlantic
Po	400	27,000	Atlantic
Rhine	800	75,000	Atlantic
Rhone	500	38,000	Atlantic
Seine	500	30,000	Atlantic
Thames	200	6,000	Atlantic
Volga	2,400	563,000	Caspian
Asia			
Amur	2,800	520,000	Pacific
Brahmaputra	1,800	425,000	Indian
Ganges	1,560	440,000	Indian
Hwang	2,700	570,000	Pacific
Indus	1,800	373,000	Indian
Irrawaddy	1,500	158,000	Indian
Lena	2,800	950,000	Arctic
Mekong	2,800	280,000	Pacific
Ob	3,200	1,000,000	Arctic
Yangtze	3,200	548,000	Pacific
Yenisei	3,000	1,500,000	Arctic
Africa			
Congo	2,900	1,200,000	Atlantic
Niger	2,600	563,000	Atlantic
Nile	3,400	1,273,000	Atlantic
Zambezi	1,500	600,000	Indian
Australia			
Darling	1,100	——	Indian
Murray	1,000	270,000	Indian

SOME OF THE LARGEST LAKES OF THE WORLD

	Area in Sq. Miles	Elevation in Feet	Greatest Depth in Feet
Aral Sea	26,900	160	225
Baikal	12,500	1,312	4,550
Balkash	7,800	780	70
Caspian	169,000	− 85[1]	2,400
Chad, variable with season and often more	10,000	800–900	12
Dead Sea	370	−1,310[1]	1,330
Erie	9,990	573	210
Great Bear Lake	11,200	200	——
Great Salt Lake	2,360	4,218	30–50
Great Slave Lake	10,100	——	over 650
Huron	23,200	580	750
Ladoga	7,000	60	730
Manitoba	1,850	810	——
Michigan	22,300	581	870
Nicaragua	3,600	110	83
Nyasa	14,000	1,500	600+
Ontario	7,104	246	738
Superior	31,829	603	1,008
Tanganyika	12,650	2,800	2,100
Titicaca	3,300	12,875	700
Victoria Nyanza	36,800	4,000	590+
Winnipeg	9,400	710	70

[1] Below sea level

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

(WEBSTER'S NEW INTERNATIONAL DICTIONARY)

ā, as in āle; â, as in sen′âte; â, as in câre; ă, as in ăm; ȧ, as in fi′nȧl; ä, as in ärm; ȧ, as in ȧsk; ȧ, as in so′fȧ; ch (=tsh), as in chair; ē, as in ēve; ê, as in ê-vent′; ĕ, as in ĕnd; ẽ, as in re′cẽnt; ē, as in fērn; f, for ph, as in philosophy; g (hard), as in go; ġz (sonant), for x, as in ex-ist′; hw, for wh, as in what; ī, as in īce; ĭ, as in ĭll; j (=dzh), for g, as in gem; k, for ch, as in chorus; ks (surd), for x, as in vex; kw, for qu, as in queen; n (ordinary sound), as in no; ŋ (like ng), for n before the sound of k or hard g, as in bank; N, representing simply the nasal tone of the preceding vowel, as in ensemble (äN′säN′bl′); ng, as in long; ō, as in ōld; ô, as in ô-bey′; ô, as in ôrb; ŏ, as in ŏdd; ȯ, as in cȯn-nect′; o͝o, as in so͝oft; oi, as in oil; o͞o, as in fo͞od; o͝o, as in fo͝ot; ou, as in out; s (sharp), as in so; sh, for ch, as in machine; t, for ed, as in baked; ū, as in ūse; û, as in û-nite′; û, as in ûrn; ŭ, as in ŭp; u̇, as in cir′cu̇s; ü, as in mē-nü′; z (like s sonant), as in zone; zh (=sh made sonant), for z, as in azure; ′ (for voice glide), as in pardon (pär′d′n).

The primary accent is indicated by a short, heavy mark (′), the secondary by a lighter mark (′).

The numbers refer to pages. The numbers of the pages on which the chief reference is to be found are indicated by heavier type. The numbers in parentheses refer to pages on which maps appear.

A

Abyssinia (ăb′ĭ-sĭn′ĭ-ȧ), *see* Ethiopia
Abyssinian Highland (ăb′ĭ-sĭn′ĭ-ăn), 453, (450)
Acapulco [Mexico] (ä′kä-po͞ol′kō), 196, (194–195)
Aconcagua, Mt. (ä′kŏn-kä′gwä), 488, (246, **269**)
Acropolis (ȧ-krŏp′ŏ-lĭs), 374, 375
Adams, Mt. (ăd′ămz), 162, (154–155)
Addis Ababa [Ethiopia] (ăd′ĭs ä′bȧ-bȧ), 452, (451)
Adelaide [South Australia] (ăd′ē-lăd), 444, (439)
Aden (ä′dĕn; ā′dĕn), British protectorate, 388, 393, (391)
Aden [Aden], city, 388, 389, 393, (391)
Adirondack Mountains (ăd′ĭ-rŏn′dăk), 30, 60, (38–39)
Adrianople [Turkey] (ā′drĭ-ăn-ō′p′l; ăd′rĭ-ăn-ō′p′l), 379, (281, **369**)
Adriatic Sea (ā′drĭ-ăt′ĭk; ăd′rĭ-ăt′ĭk), 373, (281, 368, **369**)
Ægean Sea (ê-jē′ăn), 381, 396, (281, **369**)
Afghanistan (ăf-găn′ĭ-stän′), 388, 390, 392, (385, **391**)
Africa (ăf′rĭ-kȧ), **447–465**, (450, **451**); British influence in, 453–460; development of Congo Basin by Belgians, 463–464; division into spheres of influence, 449, 452; earliest explorations, 447; French portions, 460–463; German losses, 452; republic of Liberia, 465; partition of, 452; plant regions, (448); population, (449); Portuguese possessions, 464; proportion of Europeans in, 448; prospects for Ethiopia, 464; rainfall, (447); temperature regions, (447)
Agassiz, Lake (ăg′ȧ-sē), 66, (65)
Agave plant (ȧ-gā′vē), 197
Agra [India] (ä′grä), 401, (385, **391**)
Agricultural implements, 78, 83: *See* Machinery
Agriculture, *see* Farming
Akron [Ohio] (ăk′rŭn), 88, 90, (74–75)
Alabama (ăl′ȧ-băm′ȧ; ăl′ȧ-bä′mȧ), 110, 117, 119, (102–103); area and population, 94
Alaska (ȧ-lăs′kȧ), 1, 11, 24, 158, **167–172,** (182–183); area, population, and largest city, 167; climate and products of southeastern section, 168–169; government, 171; government measures for protection and development, 171–172; prospect for northern and western, 171; southern half of main portion, 170–171; value of trade, 167–168; volcanoes in, 7
Alaska, Gulf of, 169, 171, (182–183)
Alaska Railroad, 171
Albania (ăl-bā′nĭ-ȧ), 373, 374, 377, (281, **369**)
Alberta (ăl-bûr′tȧ), 175, 176, 177, 180, 181, (182–183)
Albuquerque [N. M.] (ăl′bû-kûr′kĕ), 129, 152, (154–155)
Alderney cattle (ôl′dēr-nĭ), 297
Aleppo [Syria] (ȧ-lĕp′ō), 394, 396, (391)
Alexandria [Egypt] (ăl′ĕg-zăn′drĭ-ȧ), 455, 476, (451)
Alfalfa (ăl-făl′fȧ), 96, 112, 139, 142, **144,** 272
Algeria (ăl-jē′rĭ-ȧ), 449, 452, 460, 461, (451)
Algiers [Algeria] (ăl-jērz′), 452, **460,** (451)
Alhambra (ăl-hăm′brȧ), 360
Allegheny Plateau (ăl′ē-gā′nĭ), 30, (26–27)
Almonds, California, 141
Alp (ălp), defined, 334
Alpacas (ăl-păk′ȧz), 262
Alps (ălps), 162, 279, 287, 307, 311, 320, 331, 333, 334-335, 365, (**280,** 300–301); Dinaric, 375, 380, (280, **369**); scenery, 334-335; Transylvanian, 375, 379, (280, **369**); Tyrol, 375, (280, **300–301**)
Alsace (ăl-säs′), 313, (300–301)
Alsace-Lorraine (ăl-säs′-lŏ′rān′), 325, 327, 338, (300–301)
Altai Mountains (äl-tī′), 399, (384, **391**)
Aluminum, British Guiana, 258; Norway, 347; United States, 119
Amazon Basin (ăm′ȧ-zŏn), 245, 252–255; Congo Basin compared with, 463–464
Amazon River, 253, (250)
Ameer of Afghanistan (ȧ-mēr′), 390
Amsterdam [The Netherlands] (ăm′-stẽr-dăm), 288, 337, 338, 342, (281, **300–301**)
Anaconda [Mont.] (ăn′ȧ-kŏn′dȧ), 135, (154–155)
Andean countries (ăn-dē′ăn; ăn′dê-ăn), 258–266, (260, **269**)
Andes Mountains (ăn′dēz), 249–250, 258-266, 267, (246)
Angola (ăŋ-gō′lȧ), 464, (451)
Angora [Turkey] (ăŋ-gō′rȧ), 381, (391)
Animals, Africa, 462; Alaska, 172; in far North, 16; lacking among Indians, 22; Prairie Provinces, Canada, 187; northern Asia, 399; Yellowstone Park, 164
Antarctic zone (ănt-ärk′tĭk), 227, (227)
Anthracite, 6, 32; China, 412
Antilles (ăn-tĭl′ēz), 200, 201, (194–195)
Antimony (ăn′tĭ-mō-nĭ), China, 412
Anti-trade winds (ăn′tĭ-trād′), 233, (232)
Antofagasta [Chile] (än′tō-fä-gäs′tä), 270, (247, **269**)
Antwerp [Belgium] (ănt′wẽrp), **341,** 473, (281, **300–301**)
Apennines (ăp′ĕ-nīnz), 365, (280, **368**)
Appalachian Highland (ăp′ȧ-lăch′ĭ-ăn; ăp′ȧ-lā′chĭ-ăn), 6, 30, 111, (26–27)
Apples, British Columbia, 185; Canada, 178; Chile, 267; Madagascar, 463; Mexico, 197; Oregon, 153; South Africa, 458; Southern States, 96–97; Washington, 153; Western States, 139, 140

Apricots, Afghanistan, 392; California, 140; South Africa, 458
Arabia (*a*-rā′bĭ-*a*), 389, 392, 395, 396, (385, **391**)
Arabian Peninsula (*a*-rā′bĭ-ăn), 388, 395, (385, **391**)
Aral Sea (ăr′ăl; *a*-räl′), 398, (384, **391**)
Archangel [Russia] (ärk′ān′jĕl), 355, (281)
Arctic circle (ärk′tĭk), 226, **227,** (227)
Arctic Ocean, 171, 172, (182–183)
Arctic zone, 227, (227)
Ardennes (är′dĕn′), 307, (300–301)
Area of political units, 13, 29, 62, 94, 129, 167, 175, 188, 190, 245, 288, 349, 374, 388, 397, 401, 409, 426, 437, 452, 477–485
Arequipa [Peru] (ä′rā-kē′pä), 264, (247, **260**)
Argentina (är′jĕn-tē′n*a*), 45, 245, 258, 266, **270–275,** (247, **269**); cattle, (272); corn, (272); sheep, (272); wheat, (272)
Arizona (ăr′ĭ-zō′n*a*), 129, 141, 164, (154–155)
Arkansas (är′kăn-sô), 94, 108, 114, 116, 119, 127, (102–103)
Arkansas River, 120, 143, (102–103)
Armenia (är-mē′nĭ-*a*), 358, 395, 396. *See also* Transcaucasia
Asbestos (ăs-bĕs′tŏs), Quebec, 179; Northern and Southern Rhodesia, 457
Asia (ā′sh*a*; ā′zh*a*), **383–436,** (384, **385**); central and northern, 397–400; general facts, 383–388; Holy Land, (397); India and Ceylon, 401–408; millet, (404); plant regions, (397); population, (388); rainfall, (386); rice, (404); sorghum (404); southeastern, and East Indies, 426–435; southwestern, 358, 389–397, (391); sugar cane, (404); tea, (404); temperature regions, (383); the Far East, 409–426, (411). *See also* names of countries, etc.
Asia Minor, 388, (384, **385**)
Asphalt (ăs′fălt), 202, 203
Astoria [Ore.] (ăs-tō′rĭ-*a*), 157, (154–155)
Astrakhan [Russia] (ăs′trȧ-kăn′), 351, (281)
Asuncion [Paraguay] (ä-sōōn′syōn′), 245, (247, **269**)
Aswan [Egypt] (ä-swän′), 454, (451)
Atacama Desert (ä′tä-kä′mä), 270, (269)
Atbara River (ät′bä-rä′), 453, 454, (450)
Athens [Greece] (ăth′ĕnz), 374, 375, (281, **369**)
Atlanta [Ga.] (ăt-lăn′t*a*), 94, 121, 125, 126–127, (102–103)
Atlantic City [N. J.] (ăt-lăn′tĭk), 60, (38–39)
Atlantic coast ports, 473
Atlantic Ocean, 237, 241–243, (470–471)
Atlas Mountains (ăt′lăs), 460, (450)
Attar of roses, 376–377
Auckland [New Zealand] (ôk′lănd), 437, (439)
Australia, Commonwealth of (ôs-trā′lĭ-*a*; ôs-trāl′y*a*), 45, 161, 186, 294, 295, 424, **437–444,** (438, **439**); cattle, (441); plant regions, (440); population, (440); rainfall, (440); sheep, (442); temperature regions, (440); wheat, (441)
Austria (ôs′trĭ-*a*), 373, 378, 381, (281, **300–301**); tabulated statistics, 374
Austria-Hungary, 318, (319)
Austrians in South America, 256, 258
Automobiles, 43, **84–85,** 219, 291
Axis of earth, 225
Azerbaijan (ä′zĕr-bä-ē-jän′; ăz′ĕr-bī-jän′), 349, 358, (391)
Aztecs (ăz′tĕks), 21, 22, 196

B

Bad lands, 217, (74-75)
Baghdad [Iraq] (băg-dăd′), 380, 388, 393, 394–395, (385, **391**)
Bahama Islands (b*a*-hä′m*a*), 190, 200, (194–195)
Bahia [Brazil] (bä-ē′ä), 256, (247, **250**)
Bahia Blanca [Argentina] (bä-ē′ä blăŋ′kä), 274, (247, **269**)
Baku [Azerbaijan] (bȧ-kōō′), 353, 388, (281)
Balkan Mountains (bôl′kăn; bȧl-kän′), 375, 377, (369)
Balkan Peninsula, 374, (369)
Balkans, countries of the, 374–381, (369)
Baltic Sea (bôl′tĭk), 279, 282, 338, 343, 344, 345, 357, (300–301)
Baltimore [Md.] (bôl′tĭ-mōr), 37, 50, 51, 52, 57, 115, (38–39, **51**); oil refining at, 37; population, 29
Baluchistan (bȧ-lōō′chĭ-stän′), 401, 407, (391)
Bamboo, French Indo-China, 427; Philippine Islands, 430
Bananas, Amazon Basin, 253; Andean countries, 262; Central America, 207; Colombia, 266; Ethiopia, 464; Hawaii, 175; Mexico, 197; Pacific Islands, 446; West Indies, 202
Bangkok [Siam] (băŋ-kŏk′), 426, 427, (385, **391**)
Banking business, 53
Bank of England, 303
Barcelona [Spain] (bär′sĕ-lō′n*a*), 364, (281, **368**)
Barley, British Isles, 297; California, 141; Canada, 180, 188; China, 417; European acreage, 351, (351); Hungary and Rumania, 376; Mexico, 197; North Central States, 65; Russia, 351–352; South Africa, 458; southwestern Asia, 392; Spain and Portugal, 362
Barometers, 238
Barranquilla [Colombia] (bär′rän-kēl′yä), 263, (247, **260**)
Barre [Vt.] (băr′ĕ), (38-39); granite from, 36
Barrow, Point (băr′ō), 172, (182–183)
Basel [Switzerland] (bä′zĕl), 331, **336,** (281, **300-301**)
Basra [Iraq] (bŭs′r*a*), 395, (391)
Batavia [Java] (bȧ-tā′vĭ-*a*), 426, (439)
Baton Rouge [La.] (băt′ŭn rōōzh′), 107, (102–103)
Battle lines in 1918, (308)
Batum [Turkey] (bȧ-tōōm′), 353, (391)
Bauxite (bō′zīt), 119, 258
Bavarian china, 291
Bayonne [N. J.] (bā′yōn′), 37, (38–39)
Bayou (bī′ōō), 106
Beans, *see* Vegetables
Bears, 16
Beaumont [Texas] (bō′mŏnt), 114, (102–103)
Bedouins (bĕd′ōō-ĭnz), 392, 396
Beer, Germany, 325
Beeswax, Portuguese East Africa, 464
Beet sugar, *see* Sugar beet
Beira [Mozambique] (bĕ′ê-rä), 457, 464, (451)
Beirut [Syria] (bā′rōōt′), 395, (385, **391**)
Belfast [Northern Ireland] (bĕl-fȧst′; bĕl′fȧst), 288, 293, **305,** (300–301)
Belfort [France] (bĕl′fôr′), 307, (308)
Belgium (bĕl′jĭ-ŭm), 279, 308, 309, **337–340,** 341, (281, **300–301**); possessions in Africa, 344, 452, 463, (451); tabulated statistics, 288
Belgrade [Yugoslavia] (bĕl′grād′), 374, 379, (281, **369**)
Belize [British Honduras] (bĕ-lēz′), 190, (194–195)
Bellingham [Wash.] (bĕl′ĭng-hăm), 153, 157, (154–155)
Belt of calms, 233, (**234,** 235)
Benares [India] (bĕn-ä′rĕz), 406, (385, **391**)
Bengal (bĕn-gôl′), 404
Bengal, Bay of, 240, (391)
Benzine, 36
Bergen [Norway] (bûr′gĕn), 348, (281, **300–301**)
Bering Sea (bē′rĭng; bā′rĭng), 4, 171, 172, 399, (182–183)
Bering Strait, 1, (**3,** 182–183)
Berlin [Germany] (bûr′lĭn′), 288, 320, 321, 328, 329, (281, 300–301, **320**)
Berlin-to-Baghdad railway, 329–330, 380, 381, 393-394, 402
Berlin-to-Constantinople railway, 380, 394, (281)
Bermuda (bĕr-mū′d*a*), 444, (3)
Bern [Switzerland] (bĕrn), 333, (281, **300–301**)
Bethlehem [Pa.] (bĕth′lĕ-hĕm; bĕth′-lĕ-ĕm), 48, 49, (38–39)
Bhutan (bōō-tän′), 401, 408, (391)
Big trees of California, 216
Bilbao [Spain] (bĭl-bä′ō), 363, (368)
Billings [Mont.] (bĭl′ĭngz), 147, (154–155)
Bingham [Utah] (bĭng′ăm), 135, (474–475)
Binghamton [N. Y.] (bĭng′ăm-tŭn), 47, (38–39)
Birmingham [Ala.] (bûr′mĭng-ăm; bûr′mĭng-hăm), 94, **120,** 125, 126–127, (102–103)
Birmingham [England], 291, (281, **300-301**)
Bisbee [Ariz.] (bĭz′bē), 135, (154–155)
Bismarck Archipelago (bĭz′märk), 437, (439)
Bituminous coal, 32. *See* Coal
Black Belt, 110, (112)
Black Earth Region, Russia, 350, 358
Black Hills, 63–64, (74–75)
Black Sea, 353, 379, 381, (281)

Blanc, Mont (môn′ bläN′), 311, (300–301)
Blast furnaces, 37, **40–41,** 84, 120; Nova Scotia, 177; number in United States, 42; South Africa, 459; Youngstown, 89
Blue Grass Region, Kentucky, 111, 113, (102–103)
Blue Nile, 453, 454, (451)
Bogalusa [La.] (bō′gȧ-lōō′sȧ), 117, (102–103)
Bogota [Colombia] (bō′gō-tä′), 245, 263, (247, **260**)
Bohemia (bō-hē′mĭ-ȧ), 378
Boise [Idaho] (boi′zā), 129, 152, (154–155)
Bokhara [Usbekistan] (bō-kä′rä), 398, (385, **391**)
Bolivia (bō-lĭv′ĭ-ȧ), 245, 258–266, (247, **260**)
Bolsheviki (bōl′shĕ-vē-kē′; bōl′shĕ-vē′kē), 355
Bombay [India] (bŏm-bā′), 407, 408, 473, 476, (385, **391**)
Boots, *see* Shoes
Bordeaux [France] (bôr′dō′), 307, 310, 316, 473, (281, **300–301**)
Borneo (bôr′nē-ō), 426, 428, (438, **439**)
Bosporus (bŏs′pō-rŭs), 354, 379, 380, 381, (281, **380**)
Boston [Mass.] (bŏs′tŭn), 29, 47, 50, (38–39, **51**)
Bothnia, Gulf of (bŏth′nĭ-ȧ), 347, (281)
Boulogne [France] (bōō′lōn′y′; bōō-lōn′), 316, (482–483)
Bradford [England] (brăd′fērd), 292, (300–301)
Brahmans (brä′mănz), 387, 402
Brahmaputra River (brä′mȧ-pōō′trȧ), 403, (391)
Brazil (brȧ-zĭl′), 202, 245, **252–258,** 270, 427, (247, **250**)
Breadfruit, New Guinea, 429
Bremen [Germany] (brā′mĕn; brĕm′ĕn), 324, 328, 329, (281, **300–301**)
Breslau [Germany] (brĕs′lou), 320, 324, 329, (281, **300–301**)
Brest [France] (brĕst), 308, (300–301)
Brickmaking, 36, 44; Holland, 342; North Central States, 92–93
Bridgeport [Conn.] (brĭj′pōrt), 44, (38–39)
Brindisi [Italy] (brēn′dē-zē), 364, 373, (368)
Brisbane [Queensland] (brĭz′bân), 444, 445, (439)
Bristol [England] (brĭs′tŭl), 289, 304, (281, **300–301**)
British (brĭt′ĭsh), in Africa, 449, (451); in India, 407–408, (391); in southwestern Asia, 393, (391)
British Columbia (kō-lŭm′bĭ-ȧ), 175, 176, 177, 180, 181, 185, (182–183)
British East Africa, 452, 456, (451)
British Empire, 185–186, 188
British Guiana (gē-ä′nȧ), 245, 258, (247, **250**)
British Honduras (hŏn-dōō′rȧs), 190, 205, (194–195)
British Isles, 287, **289–305,** 318, (280, 281, **300–301**); statistics of, 288; trade of India with, 408
Bruges [Belgium] (brōō′jĕz; brüzh), 341, (482–483)
Brussels [Belgium] (brŭs′ĕlz), 288, 340, 341, (281, **300–301**)
Bucharest [Rumania] (bōō′kȧ-rĕst′; bū′kȧ-rĕst′), 374, (281, **369**)
Budapest [Hungary] (bōō′dȧ-pĕst′), 374, 378, 379, (281, **369**)
Buddhism (bōōd′ĭz′m), 387
Buenos Aires [Argentina] (bwā′-nōs ī′rās), 245, 268, 271, **273,** 473, (247, **269**)
Buffalo [N. Y.] (bŭf′ȧ-lō), 30, 42, 51, 52, 78, (38–39, **51**)
Buffalo, extermination of, 219
Buffer states, 338, 339
Bulgaria (bōōl-gā′rĭ-ȧ), 374, 375, 377, (281, **369**)
Burlington [Vt.] (bûr′lĭng-tŭn), 29, (38–39)
Burma (bûr′mȧ), 401, 404, 407, (391)
Burros (bōō′rōz; bŭr′ōz), 265
Bushmen, Australia, 442
Butte [Mont.] (būt), 129, 134, (154–155)
Butter, 399. *See* Dairying

C

Cabinet woods, 202, 205, 262
Cacao (kȧ-kä′ō; kȧ-kā′ō), Amazon Basin, 253; Brazil, 256; Central America, 207; Guayaquil, 262; western Sudan, 462
Cactus, 17
Cadiz [Spain] (kā′dĭz), 364, (281, **368**)
Cairo [Egypt] (kī′rō), 447, 448, 452, 455, (451)
Calais [France] (kăl′ā; kăl′ĭs), 307, (482–483)
Calcutta [India] (kăl-kŭt′ȧ), 401, 407, 473, 476, (385, **391**)
Calgary [Alberta] (kăl′gȧ-rĭ), 175, (182–183)
California (kăl′ĭ-fôr′nĭ-ȧ), 7, 97, 109, 110, 114, 129, 131, 134, 136, 137, **140–141,** 150, 158–161, 162, 423, (154–155); population of southern, 19; Valley of, 140, 159, (137)
Callao [Peru] (käl-yä′ō), 264, (247, **260,** 264)
Calms, belt of, 233, (**234,** 235)
Calumet [Mich.] (kăl′û-mĕt), 82, (74–75)
Cambridge University (kām′brĭj), 302
Camels, 393, 455
Cameroon (kăm′ĕr-ōōn′), 452, (451)
Camphor, East Indies, 428; New Guinea, 429
Canada (kăn′ȧ-dȧ), 24, 45, **175–188,** 294, 295, (182–183); area, 175–176; minerals, (179); Asiatic Russia compared with, 398–400; statistics of area and population, 175; surface features, 176–177; wheat, (181); wood pulp from, 35
Canadian Pacific Railway, 186
Canals, Belgium, 337; Canada, 178, 179; China, 414, (411); Columbia River, 157; France, 307; Hamburg, 325; irrigation, 138; The Netherlands, 337, 339; Panama Canal, 205–207, (206); Rhone Valley, 316; Russia, 354; Stockholm, 347; United States, 31, 73, 179; Venice, 365; Welland Canal, 91, 178, (38–39)
Cancer, tropic of, 190, 227, 234, (227)
Canned milk production, 153
Canning industry, Alaska, 168
Cantabrian Mountains (kăn-tā′brĭ-ăn), 361, 363, (280, **368**)
Canton [China] (kăn-tŏn′), 412, 415, 418, (385, **411**)
Canton River, 418
Cape Cod, 57, (38–39)
Cape Guardafui (gwär′dä-fwē′), 448, (450)
Cape of Good Hope, 447, (450)
Cape-to-Cairo railroad, 459, (451)
Cape Town [Union of South Africa], 447, 448, 449, **458,** 459, (451)
Cape Verde, (vûrd), 448, (450)
Capricorn, tropic of (kăp′rĭ-kôrn), 227, 234, (227)
Caracas [Venezuela] (kä-rä′käs), 245, 259, 263, (247, **260**)
Caravans, China, 413; Egypt, 455; northern Africa, 461; routes centering at Baghdad, 395
Cardiff [Wales] (kär′dĭf), 288, 291, 304, (300–301)
Caribbean Sea (kăr′ĭ-bē′ăn), 242, (194–195)
Caribou (kăr′ĭ-bōō), 16; Alaska, 172
Carpathian Mountains (kär-pā′thĭ-ăn), 350, 375, (280, **369**)
Carpets, 47, 341, 402
Carrara marble (kär-rä′rä), 367, 370
Cascade Range (kăs-kād′), 131, 132, 141, 151, 152, 153, 158, (154–155)
Caspian Sea (kăs′pĭ-ăn), 285, 351, 353, (281)
Caste system, India, 402, 407–408
Cast iron, 41
Catskill Mountains (kăts′kĭl), 30, 60, (38–39)
Cattle raising, Argentina and Uruguay, 272–273, (272); Australia, 440, 441, (441); Balkan countries, 376; Bokhara, 398; British Isles, 290, 296–297; Bulgaria, 377; Canada, 178, 180; Chile, (272); China, 410; Europe, (297); France, 312; Germany, 322; Holland, 343; Mexico, 197; North Central States, 78–79; Orinoco Valley, 266; Russia, 352; sections of world leading in, 468, 469, (469); South Africa, 458; Southern States, 96; southwestern Asia, 392; Spain and Portugal, 362; Switzerland, 331; United States, (71); waste in, 219; western Sudan, 462; Western States, 146
Caucasus Mountains (kô′kȧ-sŭs), 279, 350, (280, **391**)
Cayenne [French Guiana] (kā-ĕn′; kī-ĕn′), 245, (247, **250**)
Celebes (sĕl′ē-bēz; sē-lā′bĕs), 342, 426, (439)
Cement manufacture, 42–44
Cenis, Mt. (môn′ sē-nē′), 333, (300–301)
Central America, 4, 24, **204–208,** (194–195); Indians in, 21; tabulated statistics, 190; volcanoes in, 7
Central Time Belt, 230, 231, (214)
Century plant, 17

Cerro de Pasco [Peru] (sĕr′rō dā päs′kō), 265, 266, (247, **260**)
Ceylon (sē-lŏn′), 401, 404, 408, 427, (385, **391**)
Chad, Lake (chäd), 461, (451)
Champlain, Lake (shăm-plān′), 23, (38–39)
Channel Islands, 297, (300–301)
Charcoal, 221
Charleroi [Belgium] (shär′lē-rwä′), 341, (300–301)
Charleston [S. C.] (chärlz′tŭn), 94, (102–103)
Charlotte Amalie [Virgin Islands of U. S.] (shär′lŏt′ ä-mä′lē-ē), 201
Charlottetown [Prince Edward Island] (shär′lŏt-toun), 175, (182–183)
Chattanooga [Tenn.] (chăt′ȧn-nōō′gȧ), 120, (102–103)
Cheese, *see* Dairy products
Chemnitz [Germany] (kĕm′nĭts), 324, (300–301)
Chesapeake Bay (chĕs′ȧ-pēk), 11, 57, 110, (38–39)
Chestnuts, Italy, 366
Cheyenne [Wyo.] (shī-ĕn′), 129, (154–155)
Chicago [Ill.] (shĭ kô′gō), 79–82, (74–75, **82**); oil refining at, 37; population, 62
Chicago River, 81, (82)
Chile (chē′lā), 266–270, 422, (247, **269**); cattle, (272); corn, (272); sheep, (272); wheat, (272)
Chinaware, 291, 315
Chinese Republic (chī-nēz′; chī-nēs′), 108, 158, 161, **409–420,** (**385,** 411)
Chinook winds (chĭ-nōōk′), **147,** 184
Cholon [French Indo-China] (shô′lôn′), 426, (385)
Chosen (chō′sĕn′), 409, 423–424, (385, **409**)
Cincinnati [Ohio] (sĭn′sĭ-năt′ĭ), 83, **86,** 88, 89, (74–75, **88**)
Cinnamon, French Indo-China, 427
Cities, tables of population, 13, 29, 62, 94, 129, 167, 175, 188, 190, 245, 288, 349, 359, 374, 388, 397, 401, 409, 426, 437, 452, 477–485
Clay, for brickmaking, 36, 44; for pottery, 44
Cleveland [Ohio] (klēv′lȧnd), 83, 84, 86, (74–75, **86**); oil refining at, 37; population, 62
Climate, maps showing, Africa, 447; Asia, 383; Australia and New Zealand, 440; Europe, 284; North America, 16; South America, 248; United States, 99
Clock making, 315
Coal, 4; account of formation, 4–6; Alaska, 168, 170; Andean countries, 262; Argentina, 275; Australia, 441; Austria, 378; Belgium, 341; bituminous, 6, 73; British Columbia, 185; British Isles, 289; Canada, (179); Chile, 270; China, 412; Czechoslovakia, 377; England, 304; Europe, 282, (282); France, 308, 310, 313; Germany, 318, 323, 324; India, 402; Japan, 421–422; kinds of, 6; Malay Peninsula, 427; methods of conservation, 223; New Zealand, 446; North Central States, 73, (72); Northeastern States, 31–33; Nova Scotia, 177–178; Northern and Southern Rhodesia, 457; Russia, 353; Saar Basin, 326; Seattle, 158; Asiatic Russia, 399; South Africa, 459; Southern States, 114; Spain and Portugal, 363; statistics of production, 215; Ukraine, 358; United States, (5); waste in mining, 218, 223; West Africa, 463; Western States, 150; world distribution, 469, (472)
Coal Period, 4–6
Coastal Plain, 34, (2)
Coast line of North America, formation of, 10–11
Coast Range [British Columbia], 181, (2)
Coast Ranges, 131, 136, 162, (2)
Cocoa, Ecuador, 266. *See* Cacao
Coconut oil, 430
Coconuts, Ceylon, 408; Philippine Islands, 429–430, 431; Portuguese East Africa, 464; West Indies, 202
Cod fishing, Alaska, 169; British Isles, 297; Newfoundland, 177, 188; Northeastern States, 58; Norway and Sweden, 348
Cody [Wyo.] (kō′dĭ), 163, (154–155)
Coffee, Andean countries, 266; Brazil, 202, 255–256; Central America, 207; Congo Basin, 463; East Indies, 342, 428; Hawaii, 175; Java, 428; Mexico, 197; Pacific Islands, 446; Portuguese East Africa, 464; sections of world which produce, 468, (468); western Sudan, 462; West Indies, 202
Cohoes [N.Y.] (kō-hōz′), 46, (38–39)
Coke, 37, 40; waste in producing, 218
Cologne [Germany] (kō-lōn′), 320, 324, 326, 329, (281, **300–301**)
Colombia (kō-lŏm′bē-ä), 258–266, (247, **260**)
Colombo [Ceylon] (kō-lŏm′bō), 401, (385, **391**)
Colon [Panama] (kō-lōn′), 206, (**194–195,** 206)
Colorado (kŏl′ō-rä′dō), 129, 137, 152, 162, (154–155)
Colorado River, 141, 165, (154–155)
Colosseum [Rome] (kŏl′ō-sē′ŭm), 372
Columbia River (kō-lŭm′bĭ-ȧ), 137, 142, 157, (154–155)
Columbia River Highway, 131
Columbus, Christopher (kō-lŭm′bŭs), 22
Columbus [Ohio], 86, (74–75)
Commerce and foreign trade, Alaska, 168; Angola, 464; Australia, 441, 443, Balkan States, 376; Belgium, 337, 341, 344; Canada, 180, 185, 186; Central America, 207; China, 418; Denmark, 337, 343, 344; France, 306–307, 315, 316; Germany, 325, 328, 342, 347; Great Britain, 295, 298, 304, 344, 347, 449; Hawaii, 175; India, 401, 402, 408; Italy, 366, 367, 371, 373; Japan, 421, 422, 424; Kano, 462; Libia, 373; Mexico, 196, 198; The Netherlands, 337, 342, 344; Newfoundland, 189; New Zealand, 445; North Central States, 73, 78, 79, 80, 83, 89; Northeastern States, 45, 50, 52, 53; Norway, 347, 348; Pacific islands, 446; Portugal, 360, 363; Portuguese East Africa, 464; Russia, 354; Singapore, 427; South Africa, 458; South America, 256, 258, 259, 265–266, 270, 274, 275, 276; Southern States, 120, 122, 123, 126, 127; Spain, 360, 363; Sweden, 347, 348; Switzerland, 330, 335, 342; Western States, 152, 153, 157, 158, 159, 161; West Indies. 200, 202, 204
Composts (kŏm′pōsts), 416
Concepcion [Chile] (kōn-sĕp′syōn′), 270, (247, **269**)
Concrete, 43, 93
Confucian religion (kŏn-fū′shăn), 414
Congo (kŏŋ′gō), Belgian, 448, 452, (451); French, 452, (451)
Congo Basin, 463–464, (450)
Connecticut (kŏ-nĕt′ĭ-kŭt), 29, (38–39)
Conservation Commission, National, 216
Conservation of resources, 215–224
Constance, Lake of (kŏn′stȧns), 334, (300–301)
Constantinople [Turkey] (kŏn-stăn′tĭ-nō′p'l), 374, 378, **379,** 381, (281, **369**)
Continental shelf, 11
Cook Inlet, 169, (182–183)
Coöperative societies, Denmark, 343
Copenhagen [Denmark] (kō′pĕn-hā′gĕn), 288, 337, **343,** 344, (281, **300–301**)
Copper, 4; Africa, 449; Alaska, 168, 170; Andean countries, 262; Argentina, 275; Asiatic Russia, 399; Australia, 443; Chile, 270; China, 412; Germany, 323; India, 402; Japan, 422; Lake Superior district, 82, 83; Mexico, 198; Norway and Sweden, 347; Peru, 262, 266; Philippine Islands, 430–431; Northern and Southern Rhodesia, 457; Russia, 353; Spain and Portugal, 363; statistics of production, 215; United States, (133)
Copper Queen Mine, 135
Copper River [Alaska], 170, (182–183)
Copper smelting, 135
Copra (kŏp′rȧ), 430, 446
Coral reefs, 446
Cordillera, Western (kôr′dĭl-yā′rȧ; kŏr-dĭl′ĕr-ȧ), **6,** 206, (2)
Cordoba [Argentina] (kôr′dô-vä), 274, (247, **269**)
Cordoba [Mexico], 191, (194–195)
Cordoba [Spain], 364, (486)
Cork oaks, 460
Corks, Spain and Portugal, 363
Corn, 70–71; Argentina, 272, (272); Chile, 272, (272); China, 417; cotton compared with, 100–101; Egypt, 454; European acreage, 376, (376); France, 312; Hungary and Rumania, 376; India, 403; Italy, 366; Mexico, 197, (197); North Central States, 64–65, 69–70; Philippine Islands, 429; Po Valley, 370; Russia, 352; sections of world which produce, 466, (466); South Africa, 458; Southern States, 96; Spain and Portugal, 362; Sudan, 462;

United States, (69); Uruguay, 272, (272)
Corn Belt, 65, **69–70**
Costa Rica (kŏs′tȧ rē′kȧ), 190, 204, 207–208, (194–195)
Cotton, 100–105; Andean countries, 262; Argentina, 275; Arizona, 141; Brazil, 256; California, 141; Central America, 207; China, 417; Chosen, 424; Congo Basin, 463; countries of world which produce, 469; Egypt, 101, 453, 454, (453); Ethiopia, 464; India, 101, 405; long staple, 141, 453; Malay Peninsula, 426; Mexico, 197; Peru, 262; Russia, 352; South Africa, 458–459; Southern States, 100–101, 104–105, 113; southwestern Asia, 392; United States, (100); west central Asia, 398; western Sudan, 462
Cotton Belt, 100–101, 104–105, 127
Cotton-boll weevil, 105, 222; spread of, (105)
Cotton manufacturing, Alsace-Lorraine, 313, 327; Belgium, 341; France, 308; Great Britain, 292–293; Italy, 371; New England, 45–46; Southern States, 116–117; Switzerland, 336; United States, 119, (119)
Cottonseed products, 117–118, 126, 219
Cowpeas, 112
Crater Lake (krā′tẽr), 162, 164
Crawford Notch (krô′fẽrd), 59
Crimean Peninsula (krī-mē′ăn; krī-mē′ȧn), 352, (280)
Cripple Creek [Colo.] (krĭp′l), 135, (154–155)
Crop rotation, 416–417
Cuba (kū′bȧ), 200, **201–204,** (194–195); sugar, (202); statistics, 190
Cumberland Plateau (kŭm′bẽr-lănd), 111, (112)
Cumberland River, 120, (102–103)
Currants, Greece, 376
Currents, 241–244, (242); cause of, 241; effects of, 243–244; Gulf Stream, 242–243; in southern oceans, 243; Labrador Current, 243; North Atlantic Eddy, 241–242; North Pacific, 243
Cutlery, 291
Cyclones (sī′klōnz), 238
Czechoslovakia (chĕk′ô-slô-vä′kĭ-ȧ), 374, 377, (281, **369**)

D

Dairen [Manchuria] (dī′rĕn′), 409, (385)
Dairying, 178; Asiatic Russia, 399; Australia, 437, 440; British Isles, 296; Denmark, 343; Germany, 322; Holland, 342; Italy, 366, 370; New South Wales, 444; North Central States, 72; Northeastern States, 55, 56; South Africa, 458; South America, 275; Sweden, 346; Switzerland, 334; Western States, 139
Dairy products, United States, (210)
Dallas [Texas] (dăl′ȧs), 125, 127, (102–103)
Damascus [Syria] (dȧ-măs′kŭs), 388, 396, (385, **391**)
Danube, countries of the (dăn′ūb), 374–381, (281, **369**)
Danube River, 329, 375, **379,** 381, (300–301)
Danzig (dän′tsĭk), 324, **326–327,** 357, (281, **300–301**)
Dardanelles, Strait of the (där′dȧ-nĕlz′), 379, 380, 381, (281, 369, **380**)
Darling River (där′lĭng), 442, (439)
Darwin [N. Australia] (där′wĭn), 444, (439)
Daryal Gorge (dȧr-yäl′), 350
Dates, Egypt, 454; southwestern Asia, 392; Spain and Portugal, 362
Dawson [Yukon Territory] (dô′sŭn), 175, (182–183)
Daylight-saving time, 231
Degrees of latitude, 228
Dekkan (dĕk′ăn), 407, (391)
Delaware (dĕl′ȧ-wâr), 23, 29, (38–39)
Delaware Bay, 11, 110, (38–39)
Delft ware (dĕlft), 342
Delhi [India] (dĕl′hī), 407, (385, **391**)
Delta (dĕl′tȧ), of the Mississippi, 106, 107, 121, (121); of the Nile, 455, (451); of the Po, 365
Deltas, 8; of Norwegian fiords, 346
Denmark (dĕn′märk), **337–344,** (281, **300–301**); tabulated statistics, 288
Denver [Colo.] (dĕn′vẽr), 129, 135, 141, 162, (154–155)
Denver and Rio Grande R. R., 162, 164
Deserts, 17, 410
Des Moines [Iowa] (dẽ moin′), 62, (74–75)
Detroit [Mich.] (dẽ-troit′), 62, 83, **84–85,** (74–75, **86**)
Detroit River, 84–85, (74–75)
Diamonds, Africa, 449; India, 401; Northern and Southern Rhodesia, 457; South Africa, 457
Dikes, Holland, 339, 340
District of Columbia, 29, 49, 50, (38–39, **49**)
Dnieper River (nē′pẽr), 357, (281)
Dominican Republic (dô-mĭn′ĭ-kăn), 190, 200, (194–195)
Donkeys, 393, 463
Don River (dŏn), 353, (281)
Douglas [Isle of Man] (dŭg′lȧs), 288, (482–483)
Douglas fir, 153, 181
Drainage, 220
Dresden [Germany] (drĕz′dĕn), 320, 324, 329, (281, **300–301**)
Dresden china, 291
Drift, glacial, 10
Drift mining, 134
Dry farming, 144, 220, 443
Dublin [Irish Free State] (dŭb′lĭn), 288, **305,** (281, **300–301**)
Duluth [Minn.] (dŏŏ-lōōth′), 30, 82, (74–75)
Dunvegan [Alberta] (dŭn-vē′găn), 184, (182–183)
Durango [Mexico] (dŏŏ-răn′gō), 197, (194–195)
Durham [N. C.] (dûr′ăm), 118, (102–103)
Dutch East Indies (ĭn′dĭz), 426, 427, (439)
Dutch Guiana (gē-ă′nȧ), 245, 342, (247, **250**)
Dutch in New York, 23
Dyewoods, 202, 205; Andean countries, 262; Madagascar, 463; Malay Peninsula, 426; Philippine Islands, 430

E

Earth, form and size, 225; motion, 225; revolution and its effects, 225–226; shape, 225
Earthquakes, 7; Central America, 207
Eastern Time Belt, 230, 231, (214)
East Indies (ĭn′dĭz), 342, 426, **428,** (439)
Ebony, 426, 464
Ebro River (ē′brō), 361, (369)
Ecuador (ĕk′wȧ-dôr), 245, 258–266, (247, **260**)
Edinburgh [Scotland] (ĕd′n-bŭr-ō), 304–305, (281, **300–301**)
Edmonton [Alberta] (ĕd′mŭn-tŭn), 184, (182–183)
Education, *see* Schools and Education
Egypt (ē′jĭpt), 101, 294, 452, **453–455,** 464, (451); cotton, (453); wheat, (453)
Egyptian Sudan (ē-jĭp′shăn sōō-dän′; sōō-dăn′), 462, (451)
Elbe River (ĕl′bē), 329, (300–301)
Electricity, from hydroelectric plants, 115, 151
Elephants, Africa, 456, 462
Elizabeth [N. J.] (ē-lĭz′ȧ-bĕth), 29, (38–39)
England (ĭŋ′glănd), 279, 288, 291, (281, **300–301**). *See* British Isles
English in North America, 23–24
Equator (ē-kwā′tŏr), 228, (229)
Equatorial belt of calms (ē′kwȧ-tō′rĭ-ăl), 233, (**234,** 235)
Equatorial Drift, 241–242, (242)
Erie, Lake (ē′rĭ), 31, 84, 89, (26–27, **38–39**)
Erie Canal, 30, 31, 73
Eroded areas, 8
Eskimos (ĕs′kĭ-mōz), 171, 217, 226
Estonia (ĕs-tō′nĭ-ȧ), 349, 357, (281, **300–301**)
Ethiopia (ē′thĭ-ō′pĭ-ȧ), 449, 452, **464–465,** (451)
Eucalyptus (ū′kȧ-lĭp′tŭs), 442–443
Euphrates River (ū-frā′tēz), 389, 394, 395, (391)
Europe (ū′rŭp), 279–382, (280, **281**); barley, (351); cattle, (297); central, (319); corn, (376); countries of the Danube and the Balkans, 374–381, (**369,** 487); countries of western Mediterranean, 359–374, (**368,** 486); eastern, 349–358, (300–301); flax, (351); former ice areas, (283); general facts, 279; grapes, (314); mining, (282); northwestern, 288–349, (**300–301,** 482–483); plant regions, (287); population, (288); rainfall, (285); sheep, (297); sugar beets, (322); swine, (323); temperature regions, (284); wheat, (350). *See also* names of countries, etc.
Everest, Mt. (ĕv′ẽr-ĕst), 386, (391)
Everett [Wash.] (ĕv′ẽr-ĕt), 153, (154–155)

F

Fairbanks [Alaska] (fâr′bănks), 170, 171, (182–183)
Falkland Islands (fôk′lănd), 245, (247)
Fall Line, 34, 115, 124
Fall River [Mass.], 45, 47, (38–39)
Famines, Egypt, 154; India, 406; Russia, 351
Fargo [N. Dak.] (fär′gō), 62, (74–75)
Farm implements, 92, 116
Farming, British Isles, 296–297; China, 412, 415–418; France, 312; Germany, 321–323; India, 408; Italy, 365–371; New England, 54; North Central States, 63–64, 70–72; Northeastern States, 54–58; Norway, 346; Russia, 350–353; Spain and Portugal, 362–363; Southern States, 95–100; Sweden, 346; Switzerland, 334; Western States, 135–140
Faroe Islands (fâr′ō; fā′rō), 344, (281)
Fertilizer, nitrogen and limestone as, 347; use of, in Balkan States, 377; China, 416; France, 312; Germany, 321; Spain and Portugal, 362
Fez [Morocco] (fĕz), 452, 459, (451)
Figs, Baghdad, 395; California, 148; Egypt, 454; Ethiopia, 464; France, 312; Italy, 372; Russia, 352; southwestern Asia, 292
Fiji Islands (fē′jē), 446, (439)
Finland (fĭn′lănd), 279, 349, 356, (281)
Fiords (fyôrdz), Labrador, 189; Norway, 345
Fisheries, Alaska, 168; Australia, 443; British Columbia, 185; British Isles, 294, 297–298, 299; Canada, 177; France, 315; Japan, 421; Newfoundland, 188; Northeastern States, 57–58; Norway and Sweden, 347–348; Pacific Northwest, 156–157
Fiume [Italy] (fyōō′mā), 373, 374, (368)
Flax, 210; Argentina and Uruguay, 272; European acreage, 351, (351); Ireland, 290; North Central States, 65; North Dakota, 78; Po Valley, 370; Russia, 351–352
Flood plains, 8
Florence [Italy] (flŏr′ĕns), 371, 373, (281, **368**)
Florida (flŏr′ĭ-dȧ), 11, 23, 98, 104, 109, 110, 112, (102–103); area, population, and largest city, 94
Flour milling, 52, **76–78,** 84, 126; Budapest, 378; Odessa, 353; South America, 275; Western States, 149
Foochow [China] (fōō′chō′), 414, 418, (411)
Food products, Northeastern States, 54–58
Forage crops (fŏr′ăj), 141, 142
Foreign commerce of United States, 472–473, 476. *See also* Commerce and foreign trade
Forest rangers, 221–222
Forestry, Germany, 325, 330
Forests, National, 222, (222)
Forests and forest products, Alaska, 168; Andean countries, 262; Argentina, 275; Asiatic Russia, 399; Australia, 442, 443; British Columbia, 185; Canada, 177, 179, 187; Central America, 205; Chicago, 83; Ethiopia, 464; Europe, 287; Indo-China, 426; Madagascar, 463; Malay Peninsula, 426; North Central States, 91–93; Northeastern States, 35; Norway and Sweden, 346; Pacific Northwest, 153, 156; Philippine Islands, 430; Russia, 353; Southern States, 116; statistics of production, 215; waste and conservation, 217–218, 221–223; Western States, 153–156; West Indies, 202
Formosa (fôr-mō′sȧ), 409, 418, (411)
Fort William (wĭl′yăm), 179, 186, (182–183)
Forum, Roman (fō′rŭm), 372
Fossils, 4
Foxes, in arctic regions, 16
France (frȧns), **306–318,** (281, **300–301**); statistics, 288
Frankfort [Germany] (frăŋk′fŭrt), 329, (300–301)
Fraser Valley (frā′zĕr), 181, (182–183)
French, in Africa, 449, 452, 462–463, (451); in Asia, 395; in North America, 23
French Guiana (gē-ä′nȧ), 245, 258, (247, **250**)
French Indo-China (ĭn′dō-chī′nȧ), 426, 427, (385)
Fresno [Cal.] (frĕz′nō), 148, (154–155)
Frigid zones, 227, (227)
Fruits, Amazon Basin, 253; Andean countries, 266; Australia, 437, 443–444; Balkan and Danubian countries, 376; British Columbia, 185; Canada, 178; Chile, 267; Ethiopia, 464; Italy, 366, 372; Madagascar, 463; Malay Peninsula, 426; Mexico, 191, 197; Northeastern States, 56; Pacific Islands, 446; Pacific Northwest, 153; South Africa, 458; Southern States, 96–97, 109–110; Spain, 362–363; Western States, 139, 140, 141–142; West Indies, 202
Fuji, Mt. (fōō′jē), 420, (411)
Fur market, St. Louis, 79
Furniture making, Canada, 179; Germany, 325; Grand Rapids, 92; Southern States, 116; Vienna, 378
Furs, Canada, 187; Russia, 399
Fur seals, 168, 172, 219

G

Galveston [Texas] (găl′vĕs-tŭn), 52, 120, 123, 124, (102–103)
Ganges Basin (găn′jēz), 405, 407
Ganges River, 402, 406, 409, (391)
Garonne River (gȧ′rŏn′), 307, 316, (300–301)
Gary [Ind.] (gā′rĭ), 83, (74–75)
Gas, natural, 4, **33,** 114, 218–219
Gasoline, 36; consumption of, 219
Gastineau Channel (găs′tĭ-nō), 169
Gatun Lake (gä-tōōn′), 207, (206)
Geneva [Switzerland] (jĕ-nē′vȧ), 331, 332, 334, 335, **336,** (281, **300–301**)
Geneva, Lake of, 335, (300–301)
Genoa [Italy] (jĕn′ō-ȧ), 364, 370, 371, 473, 476, (281, **300–301**)
Genoa, Gulf of, 312, (300–301)
Georgetown [British Guiana], 245, (247, **250**)
Georgia [Transcaucasian Federation] (jôr′jĭ-ȧ; jôr′jȧ), 349, 358, (391)
Georgia [U. S.], 94, 97, 108, 119, (102–103)
Germans (jûr′mănz), in Africa, 452, 456; in South America, 256, 257–258; in southwestern Asia, 393–394; plan for Berlin-to-Baghdad railway, 380–381
Germany (jûr′mȧ-nĭ), 279, 291, **318–330,** (281, **300–301**); influence in Switzerland, 331; tabulated statistics, 288
Geysers, 163
Ghent [Belgium] (gĕnt), 340, 341, (300–301)
Gibraltar (jĭ-brôl′tĕr), 286, 360, 381, 393, (281, **368**)
Glaciated areas, 8, (8)
Glacier National Park (glā′shēr), 162, (154–155)
Glaciers, 8–10; New Zealand, 445; Switzerland, 335
Glasgow [Scotland] (glȧs′gō; glȧs′kō), 288, 290, **304,** (281, **300–301**)
Glassmaking, 44
Glassware, Bohemian, 378; Venetian, 371
Gloucester [Mass.] (glŏs′tĕr), 57, 58, (38–39)
Goats, Italy, 366, 371
Gold, 4, **132–135;** Africa, 449; Alaska, 168, 169, 171; Andean countries, 262; Argentina, 275; Asiatic Russia, 399; Australia, 441, 442; Chile, 270; China, 412; Mexico, 197; Ontario, 179; Philippine Islands, 430; Northern and Southern Rhodesia, 457; South Africa, 457; United States, (133)
Golden Gate, 159, 162
Golden Horn, 379
Gondolas (gŏn′dō-lȧz), 365
Göteborg [Sweden] (yû′tĕ-bôr′y′), 345, (281, **300–301**)
Grain elevators, 76
Grains, Alaska, 170; Andean countries, 262; Argentina, 272; Balkan and Danubian countries, 376; British Isles, 397; Canada, 178, 180, 188; China, 417; Egypt, 454; France, 312; Germany, 323; Italy, 366; Madagascar, 463; Mexico, 192, 197; Morocco, 460; Russia, 351–352; South Africa, 458; South America, 272; southwestern Asia, 392; Spain and Portugal, 362; Sweden, 346; Tibet, 410; western Sudan, 462
Granada [Spain] (grȧ-nä′dȧ), 360, (368)
Grand Banks [Newfoundland], 188
Grand Canyon of the Colorado (kăn′yŭn), 163, 164–165, (154–155)
Grand Rapids [Mich.], 92, (74–75)
Grand River Valley Project, 137
Granite, Northeastern States, 36
Grapefruit, 109, 141
Grapes, Argentina, 275; California, 140, 141; Canada, 178; Chile, 267; European production, 314, (314); France, 312, 313; Germany, 323; Italy, 367, 372; Mexico, 197; Po

Valley, 370; Russia, 352; Spain and Portugal, 363
Graphite (grăf′īt), 353, 399
Grazing, Brazil, 256; Canada, 188; Mexico, 197; Western States, 146–147. *See* Cattle raising
Great Britain (brĭt′n), 186, 288, **289–293,** (281, **300–301**); contrasted with Ireland, 305; interest in Africa, 453–460, (451). *See* British Isles
Greater Antilles (ăn-tĭl′ēz), 200, (194–195)
Great Falls [Mont.], 135, 151, (154–155)
Great Ice Sheet, 8–10, 63–64, 176, 187, 188, 282, 283, 320, (8)
Great Lakes, 10, 23, 178, 285–286, (26–27); importance of, **89–91**
Great Plains, 67, 69, 111, 135, 145, (112)
Great Salt Lake, 162, (154–155)
Great Valley [Chile], 267, 268
Great Valley [U. S.], 111, (112)
Greece (grēs), 374–376, (281, **369**)
Greenland (grēn′lănd), 24, 344, (3); ice sheet in, 9
Greenwich [England] (grĭn′ĭj), meridian of, 229–230, (229)
Greenwich Observatory, 303
Guadalquivir (gwä′dăl-kwĭv′ēr), 361, (368)
Guajara Mirim [Bolivia] (gwä-hä′rä mĭ-rēm′), 265, (260)
Guam (gwäm), 167, (470–471)
Guatemala [Guatemala] (gwä′tä-mä′lȧ), 190, (194–195)
Guatemala, republic, 190, (194–195)
Guayaquil [Ecuador] (gwī′ä-kēl′), 245, 259, 262, 263, 264, 266, (247, **260**)
Guayule plant (gwä-yōō′lā), 197
Guernsey cattle (gûrn′zĭ), 297
Guiana (gē-ä′nȧ), 245, **258,** 342, (247, **250**)
Guinea (gĭn′ĭ), 462, (451)
Guinea, Gulf of, 459–460, (451)
Gulf Stream, 242–243, (242)
Gums, 430, 442–443, 463
Gutta-percha (gŭt′ȧ-pûr′chȧ), 430

H

Haddock fisheries, 297
Hague, The [The Netherlands] (hāg), 342, (281, **300–301**)
Haiti (hā′tĭ), 190, 200, 202, (194–195)
Halibut fisheries, 58, 169, 348
Halifax [Nova Scotia] (hăl′ĭ-făks), 175, 178, (182–183)
Hamburg [Germany] (hăm′bûrg), 320, 324, 325, 328, 473, (281, **300–301**)
Hangchow [China] (häng′chō′), 414, 418, (385, **411**)
Hankow [China] (hăn′kō′), 409, 414, (385, **411**)
Harbors, formation of, 11; of Northeastern States, 31
Hardwoods, 116, 118; Australia, 443
Hat making, Italy, 371
Havana [Cuba] (hȧ-văn′ȧ), 190, 202, 203, (194–195)
Haverhill [Mass.] (hā′vēr-ĭl), 45, 48, (38–39)
Havre [France] (hä′vēr), 316, 318, 473, (281, **300–301**)
Hawaiian Islands (hä-wī′yăn), 161, **173–175,** 424, (434); agriculture, 174; area, population, and largest city, 167; principal products, 174–175; races, 175; value for commerce and defense, 173
Hay, Denmark, 343; Germany, 323; Kentucky, 113; Sweden, 346
Hejaz (hĕ-jäz′), 395. *See* Nejd
Helena [Mont.] (hĕl′ē-nȧ), 134, 152, (154–155)
Helsingfors [Finland] (hĕl′sĭng-fôrs′), 349, 356, (281, **300–301**)
Hemp, 370, 430, 431
Henequen (hĕn′ē-kĕn), 197
Herat [Afghanistan] (hĕr-ät′), 388, (391)
Herring fisheries, Alaska, 169; British Isles, 299; Newfoundland, 188; Norway and Sweden, 348
Hibbing [Minn.] (hĭb′ĭng), 82, (74–75)
Hides, 45, 47
High and low pressure areas, 237, 238, (238)
Himalaya Mountains (hĭ-mä′lȧ-yȧ), 240, 386, 403, (391)
Hindus (hĭn′dōōz), 406
Hoboken [N. J.] (hō′bō-kĕn), 29, (38–39)
Hogs, Chicago stockyards, 81–82; Southern States, 96; United States, 209. *See also* Swine
Holland (hŏl′ănd), 279, **337,** 339, (281, **300–301**)
Holy Land, 397, (397)
Honduras (hŏn-dōō′rȧs), 190, 205, (194–195)
Hongkong (hŏng′kŏng′), 412, 418, 476, (385, **411**)
Honolulu [Hawaii] (hō′nō-lōō′lōō), 167, 173, 476, (434)
Honshu (hŏn′shōō), 421, (411)
Hood, Mt., 162, 163, (154–155)
Hops, Czechoslovakia, 376; Germany, 323
Horn, Cape, 259, (247)
Horse latitudes, 233
Horses, 78, 410, 462
Houghton [Mich.] (hō′tŭn), 82, 83, (74–75)
Houston [Texas] (hūs′tŭn), 120, **123,** 125, (102–103)
Houston Ship Canal, 124–125, (102–103)
Hudson Bay (hŭd′sŭn), 187, (182–183)
Hudson River, 30, 31, (38–39)
Hudson's Bay Company, 187
Hull [England] (hŭl), 289, (281, **300–301**)
Hungary (hŭng′gȧ-rĭ), 374, 375, 381, (281, **369**)
Hurricanes, 239
Hwang Ho (hwäng′hō′), 413, 417, (411)
Hydraulic mining (hī-drô′lĭk), 134
Hydroelectric plants (hī′drō-ē-lĕk′trĭk), 151

I

Iberian Peninsula (ī-bē′rĭ-ăn), 307, 359–364, (368)
Icebergs, 9
Iceland (īs′lănd), 344, (281)
Ice Sheet, 8–10; traces in Canada, 176, 187, 188; in Europe, 282, 283; in Finland, 356; in Germany, 320; in North Central States, 63–64
Idaho (ī′dȧ-hō), 129, 137, (154–155)
Igneous rocks (ĭg′nē-ŭs), 4
Illimani, Mt. (ēl′yē-mä′nē), 264, (260)
Illinois (ĭl′ĭ-noi′; ĭl′ĭ-noiz′), 8, 62, 70, (74–75)
Illiteracy, *see* Schools and education
Imperial Valley, 141, (154–155)
India (ĭn′dĭ-ȧ), 101, 295, 381, **401–408,** (385, **391**)
Indiana (ĭn′dĭ-ăn′ȧ), 62, 70, (74–75)
Indianapolis [Ind.] (ĭn′dĭ-ăn-ăp′ō-lĭs), 62, 86, (74–75)
Indian Ocean, 243, (385)
Indians, 1; Alaska, 171; North America, 20–22; South America, 263
Indigo, Mexico, 197; western Sudan, 462
Indo-China (ĭn′dō-chī′nȧ), 426–427, (385)
Indus River (ĭn′dŭs), 403, (391)
Inside Passage to Alaska, 168, 169
Iowa (ī′ō-wȧ), 62, 70, (74–75)
Iquitos [Peru] (ē-kē′tōs), 253, 254, 262, (247, **260**)
Iraq (ē′räk′), 380, 388, 394–395, 396, **398,** 408, (385, **391**)
Ireland (īr′lănd), 5, 288, 289, 294, 297, 305, 306, (281, **300–301**). *See* British Isles
Irish Free State, 288, 294, (294)
Irish Sea, 305, (300–301)
Irkutsk [Irkutsk] (ĭr-kōōtsk′), 399, (411)
Iron, how obtained from iron ore, 37, 40–41; kinds of, 41
Iron Gate, 379, (369)
Iron manufactures, Czechoslovakia, 377; France, 308, 315; Germany, 324; Great Britain, 290–291; North Central States, 82, 83; Southern States, 120; Western States, 149
Iron ore, 4, 5; Asiatic Russia, 399; Austria, 378; Belgium, 341; Canada, (179); Chile, 270; China, 412; Cuba, 202; Czechoslovakia, 377; Europe, (282); France, 308, 310, 313; Germany, 323; Great Britain, 289–290; India, 402; Lake Superior district, 82; Malay Peninsula, 427; Mexico, 197, 198; mining of, 37, 82; New South Wales, 443; North Central States, (72); Northeastern States, 35; Norway and Sweden, 347; Nova Scotia, 177; Philippine Islands, 431; Northern and Southern Rhodesia, 457; Russia, 353; South Africa, 459; Southern States, 119–120; Spain and Portugal, 363; statistics, 215; Ukraine, 358; United States, (5); world distribution, 472, (472)
Irrawaddy River (ĭr′ȧ-wôd′ĭ), 407, (391)
Irrigation (ĭr′ĭ-gā′shŭn), Andean countries, 262; Australia, 443; beet sugar industry developed by, 142–143; Chile, 267; Egypt, 453, 454; Hawaii, 174; India, 406–407, 408; Japan, 423; Mexico, 191; Morocco, 460; Po Valley, 370; Western States, 135–140, (136)

Isar River (ē′zär), 329
Isle of Wight (wīt), 289, (300–301)
Italians, in Africa, 452; in Argentina, 271
Italy (ĭt′ȧ-lĭ), 287, 359, **364–374,** (281, **368**)
Ivory, 373, 456, 462

J

Jacksonville [Fla.] (jăk′sŭn-vĭl), 94, 126, (102–103)
Jamaica (jȧ-mā′kȧ), 190, 200, 202, 204, **294–295,** (194–195)
Japanese Current (jăp′ȧ-nēz′; jăp′-ȧ-nēs′), 243, (242)
Japanese Empire, 158, 161, 409, **420–426,** (385, **411**); holdings in China, 418; rice production, 108, (421); size of farms, 70; tea, (421)
Java (jä′vȧ), 342, 426, 428, (439)
Jersey cattle (jûr′zĭ), 297
Jersey City [N. J.], 29, (38–39)
Jerusalem [Palestine] (jĕ-rōō′sȧ-lĕm), 388, 389, 391, 395, 396, (391, **397**)
Jewelry manufactures, France, 315; Italy, 371; Northeastern States, 44; Switzerland, 336
Jews, 396
Jinrikishas (jĭn-rĭk′ĭ-shäz), 422
Johannesburg [Union of South Africa] (yō-hän′ĕs-bŭrg), 452, 457, 459, (451)
Johore Bharu [Non-federated Malay States] (jō-hōr′ bä-rōō′), 426
Juneau [Alaska] (jōō′nō), 167, 168, 169, (182–183)
Jura Mountains (jōō′rȧ), 307, 333, 334, (300–301)
Jute, India, 405

K

Kabul [Afghanistan] (kä′bo͝ol), 391, (385, **391**)
Kabul River, 392
Kafir corn (kä′fēr), 71
Kalgoorlie [Western Australia] (kăl-gōōr′lĭ), 442, (439)
Kamerun (kăm′ēr-ōōn′), *see* Cameroon
Kano [Nigeria] (kä′nō), 462, (451)
Kansas (kăn′zȧs), 62, 67, (74–75)
Kansas City [Kan.] 62, 79, (74–75, **78**)
Kansas City [Mo.], 79, (74–75, **78**)
Kaolin (kā′ō-lĭn), 316
Kashmir (kăsh′mēr′), 402, (391)
Katanga Highland (kȧ-täŋ′gȧ), 464, (450)
Katmandu [Nepal] (kät′män-dōō′), 401, (385, **391**)
Kaunas (kou′nȧs), *see* Kovno
Kenia Colony (kē-nyä′; kĕn′yȧ), 456, (451)
Kentucky (kĕn-tŭk′ĭ), 94, 97, 111, 116, (102–103)
Keokuk [Iowa] (kē′ō-kŭk), 73, (74–75)
Kerak (kĕ-räk′), 388, 396, (391)
Kerosene, 36
Ketchikan [Alaska] (kĕch′ĭ-kăn′), 169, (182–183)
Keweenaw Peninsula (kē′wē-nô), 83
Key West [Fla.], 203, (102–103)
Khartum [Anglo-Egyptian Sudan] (kär′to͞om′), 453, 455, (451)
Khiva [Usbekistan] (kē′vȧ), 398, (391)
Kiaochow [China] (kyou′chō′), 418, 424, (411)
Kief [Ukraine] (kē′yĕf), 357, 358, (281, **300–301**)
Kiel [Germany] (kēl), 324, (300–301)
Kiel Canal, 329, (300–301)
Kilauea (kē′lou-ā′ä), 174, (434)
Kimberley [Union of South Africa] (kĭm′bēr-lĭ), 457, 458, (451)
Kingston [Jamaica] (kĭngz′tŭn), 190, (194–195)
Kobe [Japan] (kō′bĕ), 422, 423, 473, (**411**, 422)
Kodiak Island (kŏd-yăk′), 169, (182–183)
Kongo (kŏŋ′gō), *see* Congo
Korea (kō-rē′ȧ), 409, 423, 424, (411)
Kovno [Lithuania] (kôv′nô), 349, (300–301)
Kremlin (krĕm′lĭn), 354
Kuala Lumpur [Federated Malay States] (kwä′lä lo͝om′po͝or′), 426
Kwantung [China] (kwän′to͝ong′), 409
Kyoto [Japan] (kyō′tō), 420, (411)

L

Labrador (lăb′rȧ-dôr′; lăb′rȧ-dôr), 11, **188,** 189, (182–183)
Labrador Current, 243, (242)
Lace making, Belgium, 341; France, 315
Lacquer work (lăk′ēr), Japan, 422
La Guaira [Venezuela] (lä gwī′rä), 263, 264, (247, **260**)
Lakes, list of largest, 488
La Paz [Bolivia] (lä päs′), 245, 264, (247, **260**)
La Plata [Argentina] (lä plä′tȧ), 274, (247, **269**)
Laramie [Wyo.] (lăr′ȧ-mĭ), 152, (154–155)
La Salle [Ill.] (lȧ săl′), 23, (479)
Lassen, Mt. (lăs′ĕn), 7, (154–155)
Latex (lā′tĕks), 428
Latitude and longitude, 228–230, (229)
Latvia (lăt′vĭ-ȧ), 349, 357, 358, (281, **300 301**)
Laurentian Highland (lô-rĕn′shĭ-ăn; lô-rĕn′shăn), 179, (182–183)
Lausanne, Treaty of (lō′zän′), 381
Lava, 4, 7, 372
Lead, 4; Andean countries, 262; Argentina, 275; Asiatic Russia, 399; Australia, 443; China, 412; Germany, 323; India, 402; Malay Peninsula, 427; Northern and Southern Rhodesia, 457; Spain and Portugal, 363; United States, 82, (133)
Leadville [Colo.] (lĕd′vĭl), 135, (154–155)
League of Nations, 330, 336, 381, 394
Leather manufacturing, Kano, Africa, 462; Northeastern States, 46–47; South Africa, 459; Spain, 364
Lebanon Mountains (lĕb′ȧ-nŏn), 395
Le Creusot [France] (lē krû′zō′), 310, (482–483)
Leeds [England] (lēdz), 292, (300–301)
Leghorn hats, 371
Leicester [England] (lĕs′tēr), 292, (482–483)
Leipzig [Germany] (līp′sĭk), 320, (281, **300–301**)
Lemons, California, 141; France, 313; India, 387; Italy, 366, 372; Mexico, 197; Sicily, 366; South Africa, 458; southwestern Asia, 392; Spain, 362
Leningrad [Russia] (lĕn′ĭn-grȧd), 283, 349, 351, 353, 354, (281, **300–301**)
Leningrad, University of, 355
Lesser Antilles (ăn-tĭl′ēz), 190, (194–195)
Levees (lĕv′ēz; lĕv-ēz′), 123
Lexington [Ky.] (lĕk′sĭng-tŭn), 119, (102–103)
Liberia (lī-bē′rĭ-ȧ), 449, 452, 464, **465,** (451)
Libia (lē′byȧ), 373, 452, 461, (451)
Libreville [French Equatorial Africa] (lē′brˈ-vēl′), 452, (451)
Libyan Desert (lĭb′ĭ-ăn), 461, (450)
Liége [Belgium] (lē-ĕzh′), 337, 338, 341, (300–301)
Lighters, 249
Lignite, 6, 282, 367
Lille [France] (lēl), 308, (281, **300–301**)
Lima [Peru] (lē′mä), 245, 264, (247, **260,** 264)
Limes, Abyssinia, 464; Italy, 372; Southern States, 109
Limestone, 1, 4; Belgium, 341; Great Britain, 290; Nova Scotia, 177; special uses, 40, 43
Limoges [France] (lē′mōzh′), 316, (300–301)
Limoges china, 291, 315
Linen manufacture, Alsace-Lorraine, 313, 327; Belgium, 341; France, 308; Ireland, 293, 305
Lisbon [Portugal] (lĭz′bŭn), 359, 364, (281, **368**)
Lithuania (lĭth′û-ā′nĭ-ȧ), 349, 357, (281, **300–301**)
Little Rock [Ark.], 94, 127, (102–103)
Liverpool [England] (lĭv′ēr-pōōl), 295, **304,** 473, (281, **300–301**)
Livingstone (lĭv′ĭng-stŭn), 452, (451)
Llamas (lä′mȧz), 262, 265
Lobster fisheries, 188
Lodz [Poland] (lôdz), 357, (281, **300–301**)
Logwood, 205
Loire River (lwär), 307, (300–301)
London [England] (lŭn′dŭn), 288, 289, **299, 302–304,** 473, (281, **299,** 300–301)
Longitude, *see* Latitude and longitude
Lorraine (lō′rān′), 313, 326, (300–301). *See* Alsace-Lorraine
Los Angeles [Cal.] (lōs ăŋ′gĕl-ĕs; lŏs ăn′jĕl-ĕs), 129, 141, 149–150, **158–159,** 160, 161, 162, (154–155, **160**)
Louisiana (lōō-ē′zē-ăn′ȧ), 23, 94, 106–108, 114, (102–103)
Louisville [Ky.] (lōō′ĭs-vĭl; lōō′ĭ-vĭl), 94, 118, 125, (102–103)
Low Countries, 282
Lowell [Mass.] (lō′ĕl), 45, (38–39)
Low pressure areas, 237, (238)
Lucerne [Switzerland] (lû-sĕrn′), 334, (482–483)
Lumber, Argentina, 275; Chicago, 83; North Central States, 78; Pacific Northwest, 153, 156; statistics of production, 215; substitutes for,

92–93; wood used for, 35. *See also* Forest products
Luxembourg [Luxemburg] (lŭk′sĕm-bûrg), 288, **327,** (300–301)
Luxemburg, 288, 326, 338, 341, (300–301)
Luzon (lōō-zŏn′), 431, (434)
Lynn [Mass.] (lĭn), 47, (38–39)
Lyon [France] (lē-ôn′), 314, 316, (281, **300–301**)

M

Machinery, 44–45, 82, 86; farming, 70–71, 83, 92, 112–113; flour milling, 76–77; harvesting, 68–71, 145
Mackerel fishing, 57–58
McKinley, Mt. (mȧ-kĭn′lĭ), 170, (182–183)
Madagascar (măd′ȧ-găs′kȧr), 452, 463, (451)
Madeira River (mȧ-dē′rȧ), 264, (260)
Madras [India] (mȧ-drȧs′), 404, 407, (385, **391**)
Madrid [Spain] (mȧ-drĭd′), 359, 360, **361–362,** (281, **368**)
Magdalena River (măg′dä-lā′nä), 261, 263, 266, (260)
Magdeburg [Germany] (mäg′dē-bo͝ork; măg′dē-bûrg), 323, (300–301)
Magellan (mȧ-jĕl′ăn), explorer, 435
Magellan, Strait of, 259, (269)
Mahogany, 205, 464
Mail-order houses, Chicago, 83
Maine (mān), 29, (38–39)
Maize, *see* Corn
Malaga [Spain] (măl′ȧ-gȧ), 363, (368)
Malaria (mȧ-lā′rĭ-ȧ), Italy, 366
Malay Peninsula (mȧ-lā′; mā′lā), 426, 427, (391)
Malays, 431
Malay States, Federated and **Non-federated,** 426, (385, **391**)
Mammoth Hot Springs (măm′ŏth), 163
Managua [Nicaragua] (mä-nä′gwä), 190, (194–195)
Manaos [Brazil] (mä-nä′ôs), 253, 254, (247, **250**)
Manchester [England] (măn′chĕs-tēr), 292, 473, (281, **300–301**)
Manchester [N. H.], 29, (38–39)
Manchuria (măn-cho͞o′rĭ-ȧ), 409, **410,** 418, 424, (411)
Mandates, 394
Manganese (măŋ′gȧ-nēs′; măŋ′gȧ-nēz), 347
Manhattan Island (măn-hăt′ăn), 52, (52)
Manila [Philippine Islands] (mȧ-nĭl′ȧ), 167, 426, 429, 430, 431, **432,** 434, 435, (**432,** 434)
Manila hemp, 430, 431
Manitoba (măn′ĭ-tō′bȧ), 175, 177, 180, (182–183)
Manufacturing, Africa, 459, 462; Argentina, 274; Belgium, 341; British Isles, 289–293, 302; Canada, 179, 181, 188; China, 412; Czechoslovakia, 377–378; Denmark, 343; extent and location of, North America, 211–212; France, 308, 314–315; Germany, 323–325; India, 402; influence of Ice Sheet on, 10; Italy, 371; Japan, 422, 423; Netherlands, 342; North Central States, 72–73, 78; Northeastern States, 37, 40–49; Norway and Sweden, 346–347; Poland, 357; Russia, 353; Southern States, 113–120; Switzerland, 325; United States compared with other countries in, 472; Western States, 147–150
Maoris (mä′ô-rĭz), 445
Maps, scale of, 28
Marble, 36, 367, 370
Maritime Provinces (măr′ĭ-tĭm; măr′ĭ-tĭm), 177–178, (182–183)
Marmora, Sea of (mär′mô-rȧ), 381, (281, 380)
Marquette [Mich.] (mär-kĕt′), 23, 82, (74–75)
Marseille [France] (mȧr′sâ′y′), 307, 314, **316,** 317, 473, 476, (281, **300–301**)
Maryland (mĕr′ĭ-lănd), 29, (38–39)
Maskat (mŭs-kăt′), 388, (385, **391**)
Massachusetts (măs′ȧ-cho͞o′sĕts), 29, (38–39)
Massive, Mt., 176
Matterhorn (măt′ēr-hôrn), 334, (300–301)
Mauna Loa (mou′nä lō′ä), 174, (434)
Meat packing, Argentina, 275; North Central States, 78–79; Orinoco Valley, 266; Western States, 149
Meat products, 71–72
Mecca [Nejd] (mĕk′ȧ), 388, 389, 391, 395, (385, **391**)
Medina [Nejd] (mä-dē′nä), 389, 391, 395, (385, **391**)
Mediterranean Sea (mĕd′ĭ-tēr-ā′nē-ăn), 283, 285, 286, 306, 307, 362, 364, 374, 379, 381, 387, 396, (281, **451**)
Melbourne [Victoria] (mĕl′bŭrn), 444, (439)
Memphis [Tenn.] (mĕm′fĭs), 94, 116, 125, 126, (102–103)
Mendoza [Argentina] (mĕn-dō′sä), 275, (247, **269**)
Mercator's Projection (mēr-kā′tēr), (470–471)
Mercury, Andean countries, 262; Russia, 353; Spain and Portugal, 363
Meridian [Miss.] (mē-rĭd′ĭ-ăn), 94, (102–103)
Meridians, 229, (229, **230**)
Merrimac River (mĕr′ĭ-măk), 47, (38–39)
Mersey River (mûr′zĭ), 295
Mescal (mĕs-kăl′), 197
Mesopotamia (mĕs′ō-pō-tā′mĭ-ȧ), 380, 388–396, 398, 408, (385, **391**). *See also* Iraq
Mestizos (mĕs-tē′zōz), 268
Metal manufactures, 93; France, 315; New England, 44–45; Russia, 353
Metals, consumption of, 219
Metal work, India, 401
Metz [France] (mĕts), 307, 313, (300–301)
Meuse River (mûz; mūz), 337
Mexico (mĕk′sĭ-kō), 24, 45, **190–199,** (194–195); corn, (197); Indians in, 21; similarity of Central America, 204; statistics, 190; volcanoes in, 7
Mexico, Gulf of, 8, 23, 110, 200, 286, (194–195)
Mexico City [Mexico], 21, 190, 191, 192, (194–195)
Michigan (mĭsh′ĭ-găn), 47, 56, 62, (74–75)
Michigan, Lake, 89, (26–27, **74–75**)
Middle West, *see* North Central States
Mikado (mĭ-kä′dō), 425
Milan [Italy] (mĭl′ăn; mĭ-lăn′), 359, 371, 372, (281, **368**)
Milk, *see* Dairying
Millet, China, 417; India, 403, (404)
Milwaukee [Wis.] (mĭl-wô′kē), 62, 83, 84, (74–75, **82**)
Mindanao (mĭn′dä-nä′ô), 431, (434)
Minerals and mining, 4, 132–135; Africa, 449; Alaska, 168, 169, 170, 171; Andean countries, 266; Argentina, 275; Asiatic Russia, 399; Australia, 441, 442, 445; Belgium, 341; Brazil, 256; British Isles, 289, 290; Canada, 179, 187–188; Ceylon, 408; Chile, 269–270; China, 412, 418; Czechoslovakia, 377; France, 308, 310, 313; Germany, 323–324; India, 402; Italy, 367; Japan, 421–422, 424; Madagascar, 463; Malay Peninsula, 427; Mexico, 197–198; Norway and Sweden, 347; Ontario, 179; Peru, 262; Philippine Islands, 430–431; Northern and Southern Rhodesia, 457; Russia, 353; South Africa, 457; Spain and Portugal, 363–364; Tasmania, 443; Ukraine, 358; United States compared with other countries, 469, 472; waste and conservation of, 218, 223; West Africa, 463; Western States, 133, 149; West Indies, 202
Miners, coal, 32, 33
Minidoka Irrigation Project (mĭn′ĭ-dō′kȧ), 137, 138, 139, 140, 151, (138)
Minneapolis [Minn.] (mĭn′ē-ăp′ō-lĭs), 62, **76–78,** 83, (74–75, **78**)
Minnesota (mĭn′ē-sō′tȧ), 10, 62, 65–66, (74–75)
Minsk [White Russia] (mĕnsk), 349, (281)
Missionaries in China, 419
Mississippi (mĭs′ĭ-sĭp′ĭ), 94, (102–103)
Mississippi Basin, 7–8, 10, 22, 23, 107; Amazon compared with, 252–254
Mississippi River, 8, 23, 79, 120, 121, 122, (26–27)
Missouri (mĭ-sōō′rĭ; mĭ-zōō′rĭ), 62, (74–75)
Missouri River, 9, 79, 141, 151, 163, (26–27)
Mitchell, Mt. (mĭch′ĕl), 111, 112, (102–103)
Mobile [Ala.] (mō-bēl′), 120, 123, (102–103)
Mohammedans (mō-hăm′ĕd-ănz), 387, 389, 395, 460–461; detrimental effects in Africa, 462
Mohawk River (mō′hôk), 30, (38–39)
Molasses, 107
Mollendo [Peru] (môl-yĕn′dō), 264, (247, **260**)
Mombasa [British East Africa] (mŏm-bä′sä), 456, (451)
Mongolia (mŏŋ-gō′lĭ-ȧ), 409, 410, (411)
Mongolian race (mŏŋ-gō′lĭ-ăn), 387
Monroe Doctrine (mŭn-rō′), 277
Monrovia [Liberia] (mŏn-rō′vĭ-ȧ), 452
Mons [Belgium] (môNs), 341, (482–483)

Monsoon winds (mŏn-sōōn′), 405–406
Montana (mŏn-tăn′*à*; mŏn-tā′*nà*), 129, 137, 146, 152, 162, (154–155)
Montevideo [Uruguay] (mŏn′tē-vĭd′ē-ō), 245, 274, (247, **269**)
Montgomery [Ala.] (mŏnt-gŭm′ĕr-ĭ; mŭnt-gŭm′ĕr-ĭ), 115, (102–103)
Montreal [Quebec] (mŏnt′rē-ôl′; mŭnt′-rē-ôl′), 175, 179, 180, (182–183)
Moose, 16
Moraines (mō-rānz′), 9
Morocco (mō-rŏk′ō), 452, 459, 460, 461, 462, (451)
Morocco leather, 462
Mosaic work, 401
Moscow [Russia] (mŏs′kō), 349, 350, 358, 398, (281)
Mosul [Iraq] (mō′sōōl′), 394, 395, (391)
Motion-picture production, 149–150
Mottlau River (mŏt′lou), 327
Mountains, history of, 6–7; in arid regions, 18; list of highest, 488
Mountain Time Belt, 231, (214)
Mozambique [Mozambique] (mō′zăm-bēk′), 452, (451)
Mozambique [colony], 452, (451)
Mukden [Manchuria] (mōōk-dĕn′), 418, (411)
Mulberry trees, 392
Mules, 362
Munich [Germany] (mū′nĭk), 320, (281, **300–301**)
Murmansk [Russia] (mōōr-mänsk′), 355, (281)
Murray-Darling River, 442, (439)

N

Nagasaki [Japan] (nä′gà-sä′kĕ), 423, (411)
Namur [Belgium] (nà′mür′), 338, (300–301)
Nancy [France] (năn′sĭ), 307, (300–301)
Naphtha, 36
Naples [Italy] (nā′p'lz), 371, **372,** (281, **369**)
Naples, Bay of, 372
Narvik [Norway] (när′vēk), 347, (281)
Nashville [Tenn.] (năsh′vĭl), 125, 126, (102–103)
Nashville Basin, 111, 126, (112)
Nassau [Bahama Islands] (năs′ô), 190, (194–195)
National Forests, 222, (222)
National Parks, 162–165
Natural gas, 4, **33,** 114; waste in consumption, 218–219
Naval stores, 116, **118,** 218
Nebraska (nĕ-brăs′kà), 62, 66, 136, (74–75)
Negritos (nĕ-grē′tōz), 431
Negroes (nē′grōz), Southern States, 101, 104; Sudan, 462
Nejd (nĕzhd; nād), 388, 389, 395, (385, **391**)
Nenana [Alaska] (nâ-nä′nà), 171, (182 183)
Nepal (nĕ-pôl′), 401, 408, (385, **391**)
Netherlands, The (nĕth′ēr-lăndz), 288, **337–344,** (281, **300–301**)
Nevada (nĕ-vä′dà), 129, 160, 162, (154–155)
New Amsterdam (ăm′stēr-dăm), 23
Newark [N. J.] (nū′ērk), 29, (38–39)
New Bedford [Mass.] (bĕd′fērd), 47, 48, (38–39)
New Brunswick (brŭnz′wĭk), 175, 177, (182–183)
New Caledonia (kăl-ê-dō′nĭ-*à*), 446, (439)
New England (ĭŋ′glănd), as division of United States, 25, 29; cotton manufactures, 101; lakes in, 10; manufacturing in, 44–49; trade with Maritime Provinces, 177–178. *See* Northeastern States
Newfoundland (nū′fŭn(d)-lănd′; nū′-fŭnd-lănd′), 24, 177, 188–189, (182–183)
Newfoundland Banks, 23, 57
New Guinea (gĭn′ĭ), 426, 428, 429, 437, (439)
New Hampshire (hămp′shĭr), 29, 59, (38–39)
New Haven [Conn.] (hā′v'n), 29, (38–39)
New Jersey (jûr′zĭ), 29, 35, 37, 42, 44, 55, 56, 60, (38–39)
New Mexico (mĕk′sĭ-kō), 129, 146, 289, (154–155)
New Orleans [La.] (ôr′lê-ănz), 23, 52, 94, 95, 105, 118, 120, **121–123,** 125, (102–103, **121**); San Francisco compared with, 159–161
New South Wales (wālz), 443, 444, (439)
New York Bay (yôrk), 11, 159, (52)
New York City [N. Y.], 50, **52–53,** 122, 473, (38–39, **52**); population, 29; San Francisco compared with, 159–161
New York State, 10, 29–30, 55, 56, (38–39)
New York State Barge Canal, 31, (38–39)
New Zealand (zē′lănd), 437, **444–446,** (439)
Niagara Falls (nī-ăg′*à*-rà), (38–39); formation of, 10; power from, 34, 223
Nicaragua (nĭk′*à*-rä′gwà), 190, 200, 204, 207, 208, (194–195)
Nice [France] (nēs), 312, (300–301)
Nickel, 4, 179
Niger River (nī′jēr), 488, (451)
Nile delta (nīl), 455, (450)
Nile River, 449, **453–454,** (451)
Nineveh (nĭn′ê-vĕ), 395
Ningpo [China] (nĭng′pō′), 415, (411)
Nish [Yugoslavia] (nēsh), 379, (369)
Nitrate of soda, Chile, 270
Nitrogen in soil, 220
Nomads (nōm′ădz), 461
Nome [Alaska] (nōm), 171, (182–183)
Norfolk [Va.] (nôr′fŏk), 123, (102–103)
North America (*à*-mĕr′ĭ-kà), 1–224, (2, **3**); compared with Europe in area and population, 283; distribution of population, (12); glaciated and unglaciated portions, (8); plant regions, (18); rainfall, (17); rocks, (4); temperature regions, (16)
North Atlantic Eddy, 241–242
North Cape, 345, (281)
North Carolina (kăr′ô-lī′nà), 47, 94, 97, 116, (102–103)
North Central States, 62–94; agriculture, 63–64; ancient lakes, (65); area, population, and largest cities, 62; as division of United States, 25, 29, (**74–75,** 479); comparison of Germany and, 320–321; distribution of population, 63, (63); farm machinery, 70–71; in comparison with entire United States, 93, (93); iron and coal, (72); land regions, (64); manufacturing, 72–73; meat products, 71–72
North Dakota (*dà*-kō′tà), 62, 65–66, 70, (74–75)
Northeastern States, as division of United States, 25, **29–62,** (**38–39,** 478); comparison with United States, (60); farming, truck gardening, and dairying, 54–56; food products, 54–58; great cities, 50–53; land regions, (55); population, (30); railroads, 58–60
Northern Ireland, 288, 294, (294)
North frigid zone, 227, (227)
North Island, 445, (439)
North Platte Irrigation Project, 136
North pole, 226, 227, 230, (230)
North Sea, 297, 347–348, (300–301)
North Sydney [N. S.] (sĭd′nĭ), 177, (182–183)
Northwestern States, 152–159, (154–155)
Northwest Territories [Canada], 175, (182–183)
Norway and Sweden (nôr′wā and swē′dĕn), 6, 169, 288, **344–349,** (281)
Nova Scotia (nō′*và* skō′shy*à*; nō′*và* skō′sh*à*), 23, 175, 177, (182–183)
Nuts, France, 313; western Sudan, 462

O

Oakland [Cal.] (ōk′lănd), 159, (154–155)
Oases (ô-ā′sēz; ō′*à*-sēz), 461
Oats, Alaska, 170; British Isles, 297; Canada, 180, 188; France, 312; Germany, 323; Hungary and Rumania, 376; North Central States, 65; Russia, 351; South Africa, 458; Southern States, 96; Sweden, 346; Tibet, 410
Ocean movements, 241–244, (242)
Oder River (ō′dĕr), 329, (300–301)
Odessa [Russia] (ô-dĕs′*à*), 349, 353, 358, (281, **300–301**)
Ohio (ô-hī′ō), 62, 70, (74–75)
Ohio River, 9, 79, 88, 89, (74–75)
Oil, 4; fields and pipe lines, (36); products from, and refining of, 36–37; rock, 33. *See* Petroleum
Okhotsk Sea (ô-kŏtsk′), 399, (385)
Oklahoma (ō′klà-hō′mà), 94, 96, 111, 114, 150, (102–103)
Oklahoma City [Okla.], 94, 127, (102–103)
Oleomargarine (ō′lê-ô-mär′*gà*-rēn; ō′lê-ô-mär′*gà*-rĭn), 82, 117
Olive oil, 362, 363, 367
Olives, California, 140, 141; Egypt, 454; France, 313; Italy, 366, 372; Russia, 352; southwestern Asia, 392; Spain, 362
Olympic Mountains (ô-lĭm′pĭk), 162, (154–155)
Omaha [Neb.] (ō′*mà*-hô), 62, 79, (74–75)

Oman (ō-män′), 388, (385, **391**)
Onions, 363. *See* Vegetables
Ontario, Lake (ŏn-tā′rĭ-ō), 89, (26–27, **38–39**)
Ontario [province], 175, 177, **178–180,** 185, (182–183)
Opals, 401
Opium, India, 405
Oporto [Portugal] (ō-pôr′tō), 363, (281, **368**)
Oranges, Abyssinia, 464; California, 110, 140, 141; Florida, 109, 110; France, 313; India, 387; Italy, 366, 372; Mexico, 197; Paraguay, 275; South Africa, 458; Spain, 362
Orbit of earth (ôr′bĭt), 225, (226)
Oregon (ŏr′ē-gŏn), 129, 131, 153, 162, 163, 164, (154–155)
Orient, 314, 326, 364, 371, 394, 395, 401, 427, (385, **411**)
Orinoco Valley (ō′rĭ-nō′kō), 261, 266, (250)
Orizaba [Mexico] (ō′rē-sä′bä), 193, (194–195)
Orizaba, Mt., 191, (194–195)
Orléans [France] (ôr′lā′ăN′), 283, (300–301)
Oroya [Peru] (ō-rō′yä), 262, (260)
Osaka [Japan] (ō′zä′kä), 422, 423, (**411,** 422)
Oslo [Norway] (ŏs′lō), 288, (281, **300–301**)
Ostend [Belgium] (ŏst-ĕnd′), 337, (300–301)
Ostriches, 461, 463
Ottawa [Ontario] (ŏt′*à*-wȧ), 179, 185, (182–183)
Owens River Aqueduct (ō′ĕnz), 158
Oxford University (ŏks′fērd), 302
Oyster fisheries, 57, 298, 443
Ozark Plateau (ō′zärk), 111, (112)

P

Pacific coast ports (pȧ-sĭf′ĭk), 473
Pacific Islands, 446, (439)
Pacific Northwest, *see* Northwestern States
Pacific Ocean, 243, (470–471)
Pacific Time Belt, 231, (214)
Palermo [Sicily] (pȧ-lûr′mō), 366, (281, **369**)
Palestine (păl′ĕs-tīn), 387, 388, 396, (385, **391**)
Pampas (păm′pȧz), 271, 272, (269)
Panama [Panama] (păn′*à*-mä′), 190, 206, (194–195, **206**)
Panama, Isthmus of, 205, (194–195)
Panama, Republic of, 190, (194–195)
Panama Canal, 122, 200, **205–207,** 258–259, 476, (194–195, **206**); advantages to Los Angeles, 158; influence on relations with South America, 276
Panama Canal Zone, 167, 190, 205, **206,** (206)
Panama hats, 266
Pan-American Union, 277
Paper, 35. *See also* Wood pulp
Para [Brazil] (pä-rä′), 253, 254, (247, **250**)
Paraffin, 36
Paraguay (păr′*à*-gwā; pä′rä-gwī′), 245, 273, 275, (247, **269**)
Parallels of latitude, 229, (229)
Paramaribo [Dutch Guiana] (păr′*à*-măr′ĭ-bō), 245, (247, **250**)
Parana River (pä′rä-nä′), 273, (269)
Paris [France] (păr′ĭs), 288, 307, **309–310,** 432, 434, (281, 300–301, **310**)
Parliament, British, 303
Parthenon (pär′thē-nŏn), 375
Partition of Africa, 452
Paterson [N. J.] (păt′ĕr-sŭn), 29, (38–39)
Peace River, 184, (182–183)
Peaches, Canada, 178; Mexico, 197; Southern States, 97. *See also* Fruits
Peanuts, 112
Pearl Harbor [Hawaii], 173, (434)
Pearl oysters, 443
Pearls, 401
Pears, *see* Fruits
Peat, 6, 289, 290
Pecans, 113
Peking [China] (pē-kĭng′), 412, 413, 415, (411)
Pennsylvania (pĕn′sĭl-vā′nĭ-*à*), 6, 19, 29, 32, 42, (38–39)
Pennsylvania Railway system, 31, **58–60,** (59)
Peonage (pē′ŏn-ăj), 193, 268
Pepper, *see* Spices
Perfumes, Bulgaria, 376; France, 315
Pernambuco [Brazil] (pĕr′näm-bōō′kō), 256, (247, **250**)
Persia (pēr′shȧ; pēr′zhȧ), 388, 389, 393, 395, (385, **391**)
Persian Gulf, 381, 394, 395, (391)
Perth [Western Australia] (pērth), 442, 444, (439)
Peru (pē-rōō′), 245, 253, **258–266,** (247, **260**)
Petrograd (pĕt′rō-grăd; pyĕ′trŏ-grät′), *see* Leningrad
Petroleum (pē-trō′lē-ŭm), 33, **114–115;** Alaska, 168, 170; Argentina, 275; California, 150, 158; China, 412; countries which lead in production, 472; India, 402; Iraq, 395; Japan, 422; Mexico, 197–198; Oklahoma, 150; Philippine Islands, 431; products from, 36–37; Rumania, 378; Russia, 353; Southern States, 114–115; statistics of production, 215; waste in consumption, 218–219; world distribution, 473, (473)
Philadelphia [Pa.] (fĭl′*à*-dĕl′fĭ-*à*), 29, 37, 47, 50, 52, (38–39, **50**)
Philippine Islands (fĭl′ĭ-pēn; fĭl′ĭ-pĭn), 161, 167, 426, **428–434,** (434)
Phœnix [Ariz.) (fē′nĭks), 129, 152, (154–155)
Phosphate, rock, 111, 112
Phosphorus in soil, 220
Piedmont Plateau (pēd′mŏnt), 34, 110–111, (112)
Pig iron, 40–41
Pikes Peak (pīks), 162, (154–155)
Pilatus, Mt. (pē-lä′tōōs), 334
Pineapples, Amazon Basin, 253; Florida, 110; Hawaii, 175; Mexico, 197; Pacific islands, 446; West Indies, 202
Pipe lines for oil, 37
Piræus [Greece] (pī-rē′ŭs), 374, (369)
Pittsburgh [Pa.] (pĭts′bûrg), 23, 32, 51, 52, 84, 120, 211, (38–39, **51**); glass manufactures, 44; iron and steel manufactures, 42
Placer mining (plās′ēr), 133
Plains of Mississippi Basin, 8, (26–27)
Plant life and plant regions, Africa, 448, (448); Asia, 387, (387); Australia and New Zealand, 440, (440); Europe, 287, (287); in dry regions, 17–18; North America, 18, (18); South America, 249, (249)
Plata River (plä′tä), 273, (269)
Plateaus (pla-tōz′), 488
Platinum, 353, 431
Po River, 365, 370, (368)
Po Valley, 370
Point Barrow (băr′ō), 172, (3, **182–183**)
Poland (pō′lănd), 326, 327, 349, **356–357,** (281, **300–301**)
Poles of the earth, 225, (227)
Pomegranates (pŏm-grăn′ăts), 454
Pontchartrain, Lake (pŏn′chȧr-trān′), 121, (102–103, **121**)
Popocatepetl, Mt. (pō-pō′kä-tä′pĕt′l), 191, (194–195)
Population, Africa, (449); Asia, (388); Australia, (440); factors determining density of, 19; eastern North America, 19; Europe, (288); influence of rainfall, 17–19; influence of temperature, 16–17; North America, 12–13, 16–17, (12); North Central States, (63); Northeastern States, 29–30, (30); South America, (248); Southern States, (95); tables of, in countries, states, and large cities, 13, 29, 62, 94, 129, 167, 175, 188, 190, 245, 288, 349, 359, 374, 388, 397, 401, 409, 426, 437, 452, 477–485; United States, (25); Western States, (129)
Porcelain manufacture, France, 315; Japan, 422; Limoges, 316
Port Arthur [Canada] (pōrt är′thŭr), 179, (182–183)
Port Arthur [China], 399, 418, (411)
Port au Prince [Haiti] (pōr′tō-prĂNs′; pōrt′ō-prĭns′), 190, (194–195)
Portland [Me.] (pōrt′lănd), 29, (38–39)
Portland [Ore.], 129, 149, 153, **157,** 162, 168, (154–155)
Port Nelson [Manitoba] (nĕl′sŭn), 186, (182–183)
Port of Spain [Trinidad], 190, (194–195)
Porto Rico (pōr′tō rē′kō), 167, 190, 200, **201–204,** 429, (194–195)
Ports, principal, 473
Portugal (pōr′tû-gȧl), (281, **368**). *See* Spain and Portugal
Portuguese in Africa (pōr′tû-gēz; pōr′tû-gēz′), 452, 464, (451)
Posen [Poland] (pō′zĕn), 326, (300–301)
Potash, 323, 324
Potassium in soil, 220
Potatoes, Alaska, 170; Germany, 322; Ireland, 297; Mexico, 197; Russia, 322; sections of world which produce, 467, (468); Western States, 139, 140. *See also* Vegetables
Pottery making, 44; British Isles, 290, 291; Czechoslovakia, 378; France, 315; Holland, 342; Japan, 425; Northeastern States, 44

Poznan, (pôz′nän-y′), *see* Posen
Prague [Czechoslovakia] (prāg), 374, 377, 378, (281, **369**)
Praha (prä′hȧ), *see* Prague
Prairie Provinces, 177
Precious stones, India, 401
Pressure areas in the United States, 237–238, (238)
Prevailing westerlies, 233, 236, (234)
Pribilof Islands (prē′bē-lŏf′), 172, (182–183)
Prince Edward Island (ĕd′wērd), 175, 177, 178, (182–183)
Progreso [Mexico] (prō-grā′sō), 198, (194–195)
Projection, Mercator's, *see* Mercator's Projection
Providence [R. I.] (prŏv′ĭ-dĕns), 29, 44, (38–39)
Prunes, Balkan and Danubian countries, 376; California, 140, 148
Prussia (prŭsh′ȧ), 328
Pueblo [Colo.] (pwĕb′lō), 135, (154–155)
Pueblos, 21
Puerto Colombia [Colombia] (pwĕr′tō kō-lōm′bē-ä), 263, (260)
Puget Sound (pū′jĕt), 136, 150, 153, 156, 157, 162, (154–155)
Puget Sound Region, 152–153, 156–158
Pullman cars (po͝ol′mȧn), 83
Pulque (po͝ol′kā), 197
Punakha [Bhutan] (po͝o-nŭk′ȧ), 401, (385, **391**)
Pyrenees Mountains (pĭr′ē-nēz), 279, 287, 307, 359, 361, (368)

Q

Quarrying, granite, 36; grindstone, 291; in Northeastern States, 36; marble, 367, 370
Quebec [Quebec] (kwē-bĕk′), 23, 175, 185, (182–183)
Quebec, Province of, 177, **178–180,** (182–183)
Quebracho tree (kā-brä′chō), 275
Queensland (kwēnz′lȧnd), 445, (439)
Quetta [Baluchistan] (kwĕt′ä), 401, (391)
Quicksilver, 262, 353, 363
Quincy [Mass.] (kwĭn′sĭ), 36, (38–39)
Quinine (kwī′nīn; kwĭ-nēn′), 262
Quito [Ecuador] (kē′tō), 263, (247, **260**)

R

Railroads, Andean countries, 263–265; Argentina, 274; Australia, 444; Belgium and The Netherlands, 337; Canada, 186; Chile, 268; China, 413, 415; Congo Basin, 463–464; Egypt, 455; France, 310; from France to Spain, 307; Germany, 329–330; India, 408; Japan, 422; Mexico, 193, 196; North Central States, 73; Northeastern States, 30–31, 58–60; Pennsylvania system, (59); Portuguese East Africa, 464; Rhodesian, 457; Russia, 354, (in Asia) 399–400; South Africa, 459; South America, 268; Southern States, 120–121; southwestern Asia, 393; Spain and Portugal, 360, 361; Switzerland, 332–333; United States, (214). *See also* Transportation
Rainfall, Africa, 447, (447); Andean countries, 262; Argentina, 271; Asia, 386, (386); Australia and New Zealand, 440, 441, (440); Balkan Peninsula, 376; British Isles, 285; Canada, 181–182; Central America, 204; Chile, 267; eastern Europe, 351; effect of Sierra Nevada, 160; Egypt, 453; Europe, 284–285, (285); France, 311; Germany, 321; Hawaii, 174; Italy, 365–366; Japan, 420; Mesopotamia, 394; Mexico, 191; New Zealand, 444–445; North America, (17); North Central States, 63; Philippine Islands, 432, 433; population and, 17–19; Portugal, 359; Po Valley, 370; Seattle and Los Angeles, 138; South America, 249, (249); Southern States, 99; Tibet, 410; United States, 28, (28); Western States, 130–132; West Indies, 201; winds and, (237, 239)
Rainier, Mt. (rā-nēr′), 132, 162, (154–155)
Raisins, California, 140, 148; Spain and Portugal, 362
Ranger [Texas] (rān′jēr), 114, 115, (102–103)
Rangoon [Burma] (răŋ-go͞on′), 401, 407, 427, (385, **391**)
Rattan, 430
Red River, 66, 120, (102–103)
Red Sea, 386, 393, 452, (391)
Regina [Saskatchewan] (rē-jī′nȧ), 175, (182–183)
Reindeer, Alaska, 172; Canada, 188
Religion, Brahman, 387, 402, 405, 406, 407; Buddhist, 387; Christian, 387, 389, 396; Confucian, 414; Jewish, 389, 396; Mohammedan, 387, 389, 395, 396
Reno [Nev.] (rē′nō), 129, (154–155)
Resins (rĕz′ĭnz), 430, 463
Return trade winds, 233, (232)
Reval [Estonia] (rā′väl), 349, (281, **300–301**)
Revolution of the earth, 225–226, 227, 234
Rhine River (rīn), 328, 330, (300–301)
Rhine Valley, 337, 342
Rhode Island (rōd ī′lȧnd), 29, (38–39)
Rhodes (rōdz), 373, (281, 369)
Rhodesia, Northern and **Southern** (rō-dē′zhĭ-ȧ; rō-dē′zĭ-ȧ), 452, **456–457,** (451)
Rhone River (rōn), 307, 316, (300–301)
Rhone Valley, 314
Rice, 108–109; Amazon Basin, 253; Andean countries, 262; Argentina, 275; California, 140; Ceylon, 404, (404); China, 108, 109, 417; Chosen, 424; East Indies, 428; Egypt, 454; India, 403, 404, (404); Italy, 366, 367; Japan, 108, 109, 421, 423, (421); Malay Peninsula, 426; Mexico, 197; Peru, 262; Philippine Islands, 429; Po Valley, 370; sections of world which produce, 467, 468, (468); Southern States, 108–109, 113; southwestern Asia, 392; Spain and Portugal, 363; United States, (109); western Sudan, 462
Richmond [Va.] (rĭch′mŭnd), 94, 125, (102–103)
Riffians (rĭf′yănz), 461
Riga [Latvia] (rē′gȧ), 349, 357, (281, **300–301**)
Rigi, Mt. (rē′gē), 334
Rio de Janeiro [Brazil] (rē′ō dā zhȧ-nā′rō), 245, 256, 257, (247, **250,** 257)
Rio Grande (rē′ō grän′dā), 110, (26–27)
Riviera (rē-vyā′rä), 311, 312
Roads, Albania, 377; China, 414; India, 408; Switzerland, 332
Rochester [N. Y.] (rŏch′ĕs-tēr), 47, 55, (38–39)
Rock flour, 10
Rocks, sedimentary, 1; variety and distribution, 4
Rock salt, 57
Rockwood [Tenn.] (rŏk′wo͝od), 120
Rocky Mountains, 131–132, 150, (26–27); Canadian, 176, 177, 181, (182–183)
Rome [Italy] (rōm), 366, **372,** (281, **368**)
Rosario [Argentina] (rō-sä′rē-ō), 273–274, (247, **269**)
Roses, Bulgaria, 376–377
Rosewood, 205, 426
Rosin production, 116, 118
Rotation of the earth, 225, 230, 231, 233
Rotterdam [The Netherlands] (rŏt′ĕr-dăm′), 337, 342, (281, **300–301**)
Rouen [France] (rwäN), 310, (300–301)
Royal Gorge, 162
Rubber, 87–89; Andean countries, 262; Brazil, 254–255, 427; Central America, 207; Ceylon, 408, 427; Congo Basin, 463; East Indies, 427, 428; Hawaii, 175; Madagascar, 463; Malay Peninsula, 427; Mexico, 197; North Central States, 87–89; Philippine Islands, 430; Portuguese East Africa, 464; Sumatra, 428; western Sudan, 462
Rugs, Bokhara and Khiva, 398; southwestern Asia, 392
Ruhr district (ro͝or), 324
Rumania (rō͞o-mā′nĭ-ȧ), 374, 375. 377, 378, 381, (281, **369**)
Russia, Asiatic (rŭsh′ȧ), 397–400, (385)
Russia, European, 170, 172, 282, **349–358,** 380, 381, (281); immigrants from, 67
Russian Soviet Republic (sō′vyĕt′), 397
Russian Union, 355–356, (385)
Rutland [Vt.] (rŭt′lȧnd), 36, (38–39)
Rye, Canada, 180; France, 312; Germany, 321–322; Hungary and Rumania, 376; North Central States, 65; Russia, 322, 351–352; Spain and Portugal, 362

S

Saar Basin (zär), 313, 315, 326, (300–301)
Saar River, 315
Saarburg [France] (zär′bo͝ork), 315
Sacramento River (săk′rȧ-mĕn′tō), 140, 159, (154–155)
Sacramento Valley, 108
Sahara (sȧ-hä′rȧ), 236, 447, 461, (450)
St. Anthony, Falls of (sānt ăn′thō-nĭ), 76

St. Étienne [France] (săn′tā′tyĕn′), 310, 314, (300-301)
St. Gothard Railway (sânt gŏth′ärd), 332
St. Gothard Tunnel, 332–333, (300–301)
St. Helens, Mt. (hĕl′ĕnz), 162, (154–155)
St. John [New Brunswick], 175, 178, 186, (182–183)
St. John's [Newfoundland], 188, (182–183)
St. Joseph [Mo.], 79, (74–75)
St. Lawrence, Gulf of (lô′rĕns), 11, 23, (182–183)
St. Lawrence River, 23, 178, 179, (182–183)
St. Louis [Mo.] (lōō′ĭs; lōō′ĭ), 23, 73, **79,** (74–75, **80**); Chicago and, 79–80; population, 62
St. Paul [Minn.], 76, 78, (74–75, **78**)
St. Petersburg (pē′tĕrz-bûrg), *see* Leningrad
St. Thomas [Virgin Islands of U. S.] (tŏm′ȧs), 167, 190, 201, (194–195)
Sakhalin (sȧ′kȧ-lēn′), 399, 409, (385)
Salem [Mass.] (sā′lĕm), 47, (38–39)
Salisbury [Southern Rhodesia] (sôlz′-bēr-ĭ), 452, 457, (451)
Salmon fisheries, 149, 157, 168, 169, 185, 298
Saloniki [Greece] (sä′lô-nē′kē), 374, 379, (281, **369**)
Salt, British Isles, 290; Germany, 323; Michigan, 56; New York State, 56–57
Salt Lake City [Utah], 129, 135, 141, 162, (154–155)
Salvador (săl′vȧ-dōr′), 190, (194–195)
Samoa (sä-mō′ȧ), 167, 437
San'a [Yemen] (sä-nä′), 388, (385, **391**)
San Antonio [Texas] (săn ăn-tō′nĭ-ō), 94, 125, 127, (102–103)
San Bernardino Mountains (săn bûr′-när-dē′nō), 158, (154–155)
San Francisco [Cal.] (săn frăn-sĭs′kō), 159–161, 473, (154–155, **162**)
San Francisco Bay, 11, 149, 159, 162, (154–155, **162**)
San Joaquin River (săn wä-kēn′), 140, 159, (154–155)
San José [Costa Rica] (săn hō-sā′), 190, (194–195)
San Juan [Porto Rico] (săn hwän′), 167, 190, 204, (194–195)
San Salvador [Salvador] (săn săl′vȧ-dōr′), 190, (194–195)
Santa Clara Valley [Cal.] (săn′tȧ klâr′ȧ), 148
Santa Fé [Argentina] (sän′tä fā′), 274, (269)
Santiago [Chile] (sän′tē-ä′gō), 245, 268, (247, **269**)
Santo Domingo [Dominican Republic] (sän′tō dō-mĭng′gō), 190, (194–195)
Santos [Brazil] (sän′tōzh), 256, (247, **250**)
São Paulo [Brazil] (souN pou′lōō), 256, (247, **250**)
Sarajevo [Yugoslavia] (sȧ-rä′yȧ-vō), 380, (369)
Sardinia (sär-dĭn′ĭ-ȧ), 365, (368)
Saskatchewan (săs-kăch′ē-wŏn), 175, 177, 180, (182–183)
Satsuma pottery (sät′sōō-mä), 425
Sault Ste. Marie [Mich.] (sōō′ sânt mā′rĭ), 90, 120, 181, (74–75)
Savannah [Ga.] (sȧ-văn′ȧ), 116, 118, 120, (102–103)
Savannas, 457, 462, 463
Sawmills, North Central States, 92; Norway and Sweden, 346; Pacific Northwest, 156; Southern States, 116
Scandinavia (skăn′dĭ-nā′vĭ-ȧ), 279, 287
Scheldt River (skĕlt), 341, (482–483)
Schools and education, Balkan States, 377, 378; Central America, 205, 207, 208; China, 410, 412, 414, 415, 419; Czechoslovakia, 377; Egypt, 454; Ethiopia, 464; Finland, 356; France, 310; French Africa, 462; Germany, 321; Great Britain, 302, 304–305; India, 402, 405, 407; Japan, 421; Mexico, 192–193, 199; New Zealand, 445; Philippines, 429, 431, 432, 433, 435; Poland, 356; Portugal, 361; Rumania, 377; Russia, 355; South America, 251, 252, 256, 263, 271, 274; Spain, 361; Turkey, 378; West Indies, 203
Scotland (skŏt′lănd), 279, 288, 296, (281, **300–301**). *See* British Isles
Scottish Highlands (skŏt′ĭsh), 296, (300–301)
Scranton [Pa.] (skrăn′tŭn), 32, (38–39)
Scutari [Albania] (skōō′tȧ-rē), 374, (369)
Sealing, 168, 172, 348
Seasons, 225–226, 227, (226)
Seattle [Wash.] (sē-ăt′′l), 129, 151, 153, **157–159,** 168, 473, (154–155, **158**); Los Angeles and, 158–159
Seine River (sān), 307, 310, (300-301); estuary of, 318
Senegal (sĕn′ē-gôl′), 449, (451)
Seoul [Chosen] (sĕ-ōōl′), 409, (385, **411**)
Sequoias (sē-kwoi′ȧz), 165
Serb, Croat, and Slovene State, *see* Yugoslavia
Serbia (sēr′bĭ-ȧ), 381, (369)
Seville [Spain] (sĕv′ĭl; sē-vĭl′), 361, 363, (368)
Sèvres pottery (sâ′vr'), 291, 315
Seward [Alaska] (sū′ärd), 171, (182–183)
Seward Peninsula, 171, (182–183)
Sewing machine manufacture, 44
Shad fishing, 57. *See* Fisheries
Shah of Persia (shä), 391
Shanghai [China] (shăng′hä′ĭ), 412, 415, 418, (411)
Shantung Peninsula (shän′tōōng′), 415, 418, 424, (411)
Shasta, Mt. (shăs′tȧ), 7, 162, (154–155)
Shawls, Kashmir, 402
Sheep, Alsace and Lorraine, 314; Argentina, 273, (272); Australia, 440, 441, 442, (442); Bolivia, 262; British Isles, 290; Bulgaria, 377; Chile, 275, (272); China, 410; countries which lead in, 469, (472); Denmark, 343; Europe, (297); France, 312; Germany, 322; Great Britain, 292, 296; New Zealand, 445; South Africa, 458; Spain and Portugal, 362; United States, (146); Uruguay, (272); waste in, 219; Western States, 146–147; western Sudan, 462
Sheffield [England] (shĕf′ēld), 291, (281, **300–301**)
Shetland Islands (shĕt′lănd), 297, (300-301)
Shikoku (shē′kō′kōō), 421, (411)
Shipbuilding, Belfast, N. Ireland, 305; Canada, 179; Germany, 324, 326; Glasgow, 291; Great Britain, 293–294; Japan, 422–423; Liverpool, 304; Pacific Northwest, 149, 150, 156; Spain and Portugal, 364; Western States, 149
Shoes, manufacture of, 47, 79
Shoshone Falls (shō-shō′nē), 151, (154–155)
Shoshone Irrigation Project, 139
Shoshone River, 139
Shreveport [La.] (shrēv′pōrt), 114, (102–103)
Siam (sī-ăm′; sī′ăm), 426, (391)
Siberia (sī-bē′rĭ-ȧ), 397–398, (385)
Sicily (sĭs′ĭ-lĭ), 365, 366, 367, 370, 372, (368)
Sierra de Cordoba (sĭ-ĕr′ȧ dā kôr′-dō-vä), 271
Sierra Morena (mō-rā′nä), 363, (368)
Sierra Nevada [Spain] (nē-vä′dȧ), 361, 363, (368)
Sierra Nevada [U. S.], 131, 132, 158, 160, (154–155)
Silk industry, Asia, 387; China, 417; countries leading in, 469; Italy, 366, 367, 371; Japan, 425; France, 314
Silk manufacturing, Alsace-Lorraine, 313–314, 327; France, 314; Germany, 325; Italy, 371; Switzerland, 336
Silver, 4; Andean countries, 262; Argentina, 275; Australia, 443; Chile, 270; China, 412; Germany, 323; Mexico, 197, 198; Ontario, 179; Philippine Islands, 431; Northern and Southern Rhodesia, 457; Tasmania, 443; Western States, 149; United States, (133)
Simplon Pass Railroad (sĭm′plŏn), 332
Simplon Tunnel, 332
Singapore [Straits Settlements] (sĭn′gȧ-pōr′), 426, **427,** 473, 476, (385, **391**)
Sinkiang [China] (sĭn′kyäng′), 409, 410, (385)
Sioux City [Iowa] (sōō), 79, (74–75)
Sioux Falls [S. Dak.], 62, (74–75)
Si River (sē), 413, (**384,** 411)
Sisal hemp (sē-säl′; sĭs′ăl; sī′săl), 197, 198, 199
Skagway [Alaska] (skăg′wā), 169, (182–183)
Slate, 36, 290
Smyrna [Turkey] (smûr′nȧ), 388, **396,** (385, **391**)
Snake River, 137, (154–155)
Sofia [Bulgaria] (sō′fē-yȧ; sō-fē′ȧ), 374, 379, (281, **369**)
Soil, conservation of, 216–217, 220–221; destruction of, in Italy, 365
Solomon Islands (sŏl′ō-mŭn), 437, (439)
Soo Canals (sōō), 179, (38–39)
Sorghums (sôr′gŭmz), 144–145
South Africa, Union of, 452, **457–460,** (451)

South America, 245–278, (246, **247**); general facts, 245–252; plant regions, (249); population, (248); rainfall, (249); temperate region, 266–277, (269); temperature regions, (248); tropical parts, 252–258, (250, 260). *See also* names of countries, etc.
South Australia (ôs-trā′lĭ-*ȧ*; ôs-trāl′-*yȧ*), 443, (439)
South Carolina (kăr′ô-lī′*nȧ*), 94, 108, 112, (102–103)
South Chicago [Ill.] (shĭ-kô′gō), 83, (82)
South Dakota (*dȧ*-kō′*tȧ*), 62, 65–66, (74–75)
Southern States, 45, 47, 48, **94–128;** area, population, and largest cities, 94, 125–127; as division of United States, 25, 29, (102–103); cane sugar, 105–108, (106); coast cities, 123; comparison with United States, (128); cotton production, 100–101, 104–105, (100); density of population, 95, (95); farm products, 95–100; land regions, (112); manufacturing, 113–120; opportunity for farmer in, 110–113; rice production, 108–109, (109); transportation, 120–121
South frigid zone, 227, 232, 236, (227)
South Island, 445, (439)
South pole, 226, (227)
Southwestern Asia, 388–397, (391)
Soy beans, 112, 416
Spain (spān) **and Portugal** (pōr′tû-*gȧl*), 287, 291, **359 364,** (281, **368**)
Spaniards in North America, 22
Spheres of influence, 449
Spices, Ceylon, 408; East Indies, 342, 428; India, 401; Malay Peninsula, 426, 428; West Indies, 202
Spokane [Wash.] (spō′kăn′), 135, 146, 149, (154–155)
Spokane River, 151, (154–155)
Sponges, Libia, 373
Spring wheat, 65–66
Standard time, 230–231
Stanley [Falkland Islands] (stăn′lĭ), 245
Stanley Falls, 464, (451)
Stassfurt [Germany] (shtäs′fo͝ort), 323, 324, (482–483)
Steel manufacturing, 5, **41;** Czechoslovakia, 377; France, 308, 315; Germany, 324; Great Britain, 290–291; Northeastern States, 41–42; Spain, 363; United States, 5, (5); Western States, 149
Stephenson, George (stē′vĕn-sŭn), 290
Steppes, Russian (stĕps), 400, (385)
Stettin [Germany] (shtĕ-tēn′), 324, 326, (281, **300–301**)
Stockholm [Sweden] (stŏk′hōlm), 288, 345, 347, (281, **300–301**)
Stock raising, *see* Cattle raising
Stockyards, Chicago, 80–82; Kansas City, Mo., 79
Straits Settlements, 426, 427, 429, (391, **429**)
Strasbourg [France] (strȧs′bo͝or′; străs′bûrg), 313, **314,** 324, (281, **300–301**)
Sudan (so͞o-dän′; so͞o-dăn′), 462, (451)
Sudanese (so͞o′*dȧ*-nēz′; so͞o′*dȧ*-nēs′), 462
Sudan grass, 145
Suez Canal (so͞o-ĕz′; so͞o′ĕz), 334, 365, 381, 393, 394, 408, 453–454, 476, (451)
Sugar beet, 106, **142–144;** California, 140, 143; Colorado, 143; Czechoslovakia, 377; European acreage, 322, (322); France, 312, 315; Germany, 322, 325; Holland, 342; Hungary and Rumania, 376; Michigan, 143; sections of world which produce, 467, (467); United States, 106, 107, (106); Western States, 139
Sugar cane, 105–108; Abyssinia, 464; Amazon Basin, 253, 255; Andean countries, 262, 266; Argentina, 275; Brazil, 256; Central America, 207; Congo Basin, 463; Cuba, 107, 108, 201–202, (202); East Indies, 342, 428; Egypt, 454, 455; Hawaii, 161, 174–175; India, 403, 404, (404); Java, 428; Malay Peninsula, 426; Pacific islands, 446; Peru, 262; Philippine Islands, 429; Porto Rico, 201–202; Portuguese East Africa, 464; South Africa, 459; Southern States, 105–108; Spain and Portugal, 363; United States, (106); West Indies, 107, 201–202; world production, 467, (467)
Sugar refining, 118, 149; Budapest, 378; Philippine Islands, 429; San Francisco, 161
Sulphur, Italy, 119, 367, 370; Louisiana and Texas, 119; Philippine Islands, 431
Sulphur products, 119
Sultan of Turkey (sŭl′tăn), 391
Sumatra (sô͝o-mä′trȧ), 342, 426, (385)
Superior [Wis.] (sû-pē′rĭ-ēr), 84, (74–75)
Superior, Lake, 82, (26–27, **74–75**)
Sweden (swē′dĕn), 291, **344–349;** statistics, 288, (281)
Swedes in Delaware, 23
Sweet potatoes, 97
Swine, 209, 322–323, 343, 346; Europe, (323); United States, (209); world distribution, 468, 469, (469)
Switzerland (swĭt′zĕr-lȧnd), 288, **330–336,** (281, **300–301**)
Sydney [Australia] (sĭd′nĭ), 437, 444, (439)
Sydney [N. S.], 177, (182–183)
Syracuse [N. Y.] (sĭr′*ȧ*-kūs′; sĭr′*ȧ*-kūs′), 56, (38–39)
Syria (sĭr′ĭ-*ȧ*), 388, 392, 393, 395–396, (385, **391**)

T

Table Bay, 458
Table Mountain, 458
Tacoma [Wash.] (*tȧ*-kō′*mȧ*), 153, 158, 162, 168, (154–155, **158**)
Tacoma, Mt., *see* Rainier, Mt.
Tagus River (tā′gŭs), 364, (368)
Tahoe Lake (tä′hō; tä′hō), 162, (154–155)
Taihoku [Taiwan] (tī-hō′ko͞o), 409, (411)
Taiwan (tī′wän′), 409, 418, 423, (411)
Taj Mahal (täj *mȧ*-häl′), 401
Tallinn (tȧl′lĭn), *see* Reval
Tampico [Mexico] (tăm-pē′kō), 197, 198, (194–195)
Tanana Valley (tä′nä-nä′), 170, (182–183)
Tananarive [Madagascar] (tȧ′nȧ′nȧ′-rēv′), 452, (451)
Tangerines, Florida, 110
Tanneries, 47
Tannic acid, 47
Tar production, 116
Tashkent [Usbekistan] (tȧsh′kĕnt′), 398, (385, **391**)
Tasmania (tăz-mā′nĭ-*ȧ*), 443, (439)
Tea, Ceylon, 404, 405, 408, (404); China, 387, 417; Foochow, 414; Formosa, 423; India, 404, (404); Japan, (421); Paraguay, 275; sections of world which produce, 468
Teakwood, 426
Tegucigalpa [Honduras] (tā-go͞o′sē-gäl′pä), 190, (194–195)
Teheran [Persia] (tĕ-h'rän′), 388, 391, (385, **391**)
Tehuantepec Railway (tā-wän′tā-pĕk′), 196, (194–195)
Temperate zones, 227, (227)
Temperature, distribution of, 240–241; maps showing, 16, 99, 248, 284, 383, 440, 447; population and, 16
Tennessee (tĕn′ĕ-sē′), 94, 111, 112, 116, 119, (102–103)
Tennessee River, 120, (102–103)
Terek River (tyā′rĕk), 350
Teton Range (tē′tŏn), 137, (154–155)
Texas (tĕk′sȧs), 94, 96, 101, 106, 113, 114, 115, (102–103)
Textile manufactures, Alsace-Lorraine, 313–314, 327; France, 308; Great Britain, 291–293; Italy, 371; Japan, 422; New England, 45–46; Russia, 353; Spain and Portugal, 364; Switzerland, 336; United States, 119; Vienna, 378. *See also* Cotton, Woolen, *and* Silk manufacturing
Thames River (tĕmz), 299, (300–301)
Thane [Alaska] (thān), 169, (182–183)
Tibet (tĭ-bĕt′; tĭb′ĕt), 386, 409, **410,** (385, **391**)
Tientsin [China] (tĭ-ĕn′tsēn′), 414, (411)
Tierra del Fuego (tyĕr′rä dĕl fwā′gō), 273, (269)
Tiflis [Georgia] (tyĕ-flyĕs′), 388, (385, **391**)
Tigris River (tī′grĭs), 389, 394, 395, (391)
Timbuktu [French West Africa] (tĭm-bŭk′to͞o), 461, (451)
Time belts, 230–231, (214)
Tin, Bolivia, 262, 266; British Isles, 290; China, 412; Malay Peninsula, 427; Singapore, 427
Tobacco, 97; Andean countries, 262; Cuba, 202; Germany, 323; Malay Peninsula, 426; Philippine Islands, 430; South Africa, 458; Southern States, 97; United States acreage, 97, (97); western Sudan, 462
Tobacco manufactures, 118–119, 459
Tobolsk [Ural] (tō-bŏlsk′), 399, (385)
Tokyo [Japan] (tō′kĕ-ō), 409, 420, 421, 422, 423, 424, (**411,** 422)

Tomsk [Tomsk] (tômsk), 399, (385)
Tornadoes, 238
Toronto [Ontario] (tô-rŏn′tō), 175, 179, 185, (182–183)
Torrid zone, 227
Tournai [Belgium] (tōōr′nĕ′), 341, (482–483)
Tractors on farms, 70
Trade, *see* Commerce and foreign trade
Trade routes, international, 473, 476
Trade winds, 233, 241, 255, 389, (**234,** 235)
Trans-Andean Railway (trănz′ăn-dē′-ăn), 268
Transcaucasia (trănz′kô-kā′shĭ-*ȧ*; trănz′kô-kā′sha), 352, 358, (281, **391**)
Transcaucasian Federation, *see* Transcaucasia
Trans-Jordan (trănz-jôr′dăn), *see* Kerak
Transportation, Alaska, 170–171; Andean countries, 263; Argentina and Uruguay, 273–274; Australia, 444; Canada, 178–179, 186; China, 413–414, 415, 417–418; Congo Basin, 463–464; eastern cities of United States, 50; freight in United States, (213); Great Lakes, 89–91; Hudson River, 30; importance and extent of routes in United States, 212–213; India, 408; Italy, 371; Japan, 422; lack of, in Africa, 462; Mexico, 193, 196; North Central States, 73–74; Northeastern States, 30–31; Norway and Sweden, 345; Pacific Northwest, 157–158; Rhine, 329; Russia, 354; South Africa, 459; Southern States, 120–121; southwestern Asia, 393; Spain and Portugal, 361; Switzerland, 332–333
Trans-Siberian Railway (trănz′sī-bē′-rĭ-ăn), 399–400, (385)
Treadwell mines (trĕd′wĕl), Alaska, 169
Trenton [N. J.] (trĕn′tŭn), 44, (38–39)
Trieste [Italy] (trē-ĕst′), 373, 476, (281, **368**)
Trinidad (trĭn′ĭ-dăd′), 202, 203, (194–195)
Tripoli [Libia] (trĭp′ô-lĭ), 452, (451)
Trondhjem [Norway] (trŏn′yĕm), 345, (281)
Tropical zone, 227, (227). *See also* Torrid zone
Truck gardening, Australia, 437; British Isles, 297; Northeastern States, 55; South Africa, 458; Southern States, 98–100
Tucson [Ariz.] (tōō-sŏn′), 130, (154–155)
Tucuman [Argentina] (tōō′kōō-män′), 275, (247, **269**)
Tulsa [Okla.] (tŭl′sȧ), 114, (102–103)
Tundras (tōōn′drȧz), 399
Tunis [Tunisia] (tū′nĭs), 452, (451)
Tunisia (tū-nĭsh′ĭ-*ȧ*; tū-nĭsh′ȧ), 452, 460, 461, (451)
Tunnels, Switzerland, 332–333
Turin [Italy] (tū′rĭn; tū-rĭn′), 371, (281, **368**)
Turkey in Asia (tûr′kĭ), 388, **396,** (385, **391**)
Turkey in Europe, 374, 381, (369)
Turkish Empire, former, 391, 453; losses of, from World War, 394–397
Turpentine, 116, 118, 221
Tuxpam [Mexico] (tōōs′päm), 197, 198, (194–195)
Twin Cities, 76, (74–75)

U

Uganda (ōō-gän′dä; ū-găn′dȧ), 456, (451)
Ukraine (ū′krān), 349, 358, (281)
Ungava Bay (ŭŋ-gā′vȧ; ŭŋ-gä′vȧ), 187, (182–183)
Union Stockyards, Chicago, 80–82
United States, (14–15, **26–27,** 474–475); area and location, 24–25; cattle, (71); Census divisions, (29); comparisons with other countries, 270–274, 437, 440, 466–476, (466–469, 472–473); corn, (69); cotton, (100); cotton mills, (119); cross section, (7); dairy products, (210); dependencies, 167–175, (470–471); foreign commerce, 186, 472–473, 476; freight routes, (213); imports and exports, (213); increase of territory, 167; international routes, 473, 476; mineral deposits, (5, 133); national forests, (222); oil fields and pipe lines, (36); population, 25, (25); precious metals, (133); railroad map, (214); rainfall, (28); relations between temperate South America and, 276–277; rice, (109); sectional divisions, (29); sheep, (146); sugar, (106); swine, (209); tobacco, (97); weather maps, (99); wheat, (64)
Ural Mountains (ū′rȧl), 349–350, 353, 399, (280)
Uruguay (ū′rō-gwā; ōō′rōō-gwī′), 245, **271–273,** (247, **269**); cattle, (272); corn, (272); sheep, (272); wheat, (272)
Uspallata Pass (ōōs′päl-yä′tä), 268, (269)
Utah (ū′tô; ū′tä), 129, 152, 160, (154–155)
Utica [N. Y.] (ū′tĭ-kȧ), 47, (38–39)

V

Vacations, need for, 60
Valdai Hills (vȧl-dī′), 349, (300–301)
Valencia [Spain] (vȧ-lĕn′shĭ-*ȧ*; vȧ-lĕn′-shȧ), 362, 363, (281, **368**)
Valparaiso [Chile] (vȧl′pȧ-rā′zō), 267, 268, (247, 266, **269**)
Vancouver [British Columbia] (văn-kōō′vĕr), 175, 186, (182–183)
Vanilla, 262, 463
Vaseline, 36
Vatican (văt′ĭ-kăn), 373
Vegetables, Abyssinia, 464; Alaska, 170; Amazon Basin, 253; Andean countries, 262; British Isles, 297; Canada, 178, 188; Chile, 267; China, 417; Egypt, 454; Italy, 366; Madagascar, 463; Pacific Northwest, 153; Southern States, 97; Spain and Portugal, 363; Western States, 140, 141; western Sudan, 462; West Indies, 202
Vegetation, *see* Plant life and plant regions
Venezuela (vĕn′ĕ-zwē′lȧ), 245, **258–266,** (247, **260**)
Venice [Italy] (vĕn′ĭs), 364, 365, 371, 373, (281, **368**)
Vera Cruz [Mexico] (vā′rä krōōs′; vĕr′ȧ krōōz′), 196, (194–195)
Verdun [France] (vĕr′dŭn′), 307, 308, (300–301)
Vermont (vĕr-mŏnt′), 29, 36, (38–39)
Vesuvius, Mt. (vē-sū′vĭ-ŭs), 372, (368)
Vevey [Switzerland] (vē-vā′), 335
Vicksburg [Miss.] (vĭks′bûrg), 120, (102–103)
Victoria [Australia] (vĭk-tō′rĭ-ȧ), 443, (439)
Victoria [British Columbia], 184, (182–183)
Victoria [Hongkong], 412, 418, (411)
Victoria Falls, 456, (450)
Victoria Nyanza (nyän′zä), 453, (451)
Vicunas (vĭ-kōōn′yȧz), 262
Vienna [Austria] (vē-ĕn′ȧ), 374, 378, (281, **300–301**)
Vienne River (vyĕn), 316
Vigo [Spain] (vē′gō), 364, (368)
Virginia (vĕr-jĭn′ĭ-*ȧ*), 94, 97, (102–103)
Virginia [Minn.], 82, (74–75)
Virgin Islands of U. S., 167, 190, 200, **201,** (194–195)
Vistula Basin, (vĭs′tū-lȧ), 357
Vistula River, 327, (300–301)
Vladivostok [Primorsk] (vlȧ′dĭ-vŏs-tôk′), 399, (385)
Volcanoes, 7; Central America, 207; East Indies, 428; Hawaii, 174
Vosges Mountains (vōzh), 307, 313, 315, (300–301)
Vulcanizing rubber, 87–88

W

Wales (wālz), 288, 291, (281, **300–301**)
Wall Street, 53
Walrus fisheries, 348
Waltham [Mass.] (wôl′thăm), 44, (38–39)
Warsaw [Poland] (wôr′sô), 349, 353, 356, 357, (281, **300 301**)
Washington [D. C.] (wŏsh′ĭng-tăn), 29, 49–50, (38–39, **49**)
Washington [state], 129, 131, 141, 146, 152, 158, (154–155)
Waste of natural resources, 215–220
Watchmaking, New England, 44; Switzerland, 331, 335
Water buffalo, 405
Waterbury [Conn.] (wô′tĕr-bĕr-ĭ), 44, (38–39)
Water power, Austria, 378; Canada, 181; conservation of coal and, 223; electricity from, 223; France, 313; Italy, 371; Japan, 425; New England, 47; North Central States, 72–73; Northeastern States, 34; Norway and Sweden, 347; Southern States, 115–116; Spain and Portugal, 363; Switzerland, 335; Western States, 150–151
Watt, James (wŏt), 290
Weather Bureau, 238
Weathering of rock, 10

Weather maps, 238, (99, 238)
Wedgwood china, 291
Welland Canal (wĕl′ănd), 91, 178, 179, (74–75)
Westerlies, prevailing, *see* Prevailing westerlies
Western Cordillera (kôr′dĭl-yā′rȧ; kŏr-dĭl′ĕr-ȧ), 6, (154–155)
Western States, 45, **129–167;** area, population, and largest cities, 129; as division of United States, 25, 29, (154–155); cities or towns in arid regions, 152; comparison with United States, (166); density of population, 129–130, (129); grazing, 146–147; irrigation, 135–140, (136); land regions, (137); manufacturing, 147–150; mining, 132–135, (133)
West Indies (ĭn′dĭz), 24, 167, 190, **200–204,** (194–195)
West Virginia (vĕr-jĭn′ĭ-ȧ), 94, 116, (102–103)
West Wind Drift, 243, 284, (242)
Whaling, 16, 172, 219, 348
Wheat, Alaska, 170; Argentina, 272, (272); Asiatic Russia, 399, 400; Australia, 440, 441, (441); Balkan and Danubian countries, 376; British Isles, 297; California, 140; Canada, 180, 181, 188, (181); Chile, 272, (272); China, 417; cotton compared with, 100; Egypt, 453, (453); European production, 350, (350); France, 312; India, 403; Italy, 366, 367, 370; Kansas, 66–69; manufacture of flour, 76–78; Mexico, 197; North Central States, 64–69; Russia, 351–352; sections of world which produce, 467, (467); South Africa, 458; Southern States, 96–99; southwestern Asia, 392; Spain and Portugal, 362; statistics of production, 215; Tibet, 410; typical farm, 66–69; United States, (64); Uruguay, 272, (272); Western States, 145; western Sudan, 462
Wheeling [W. Va.] (hwēl′ĭng), 94, (102–103)
White Russia, 349, 358, (300–301)
White Mountains, 59, 60, (38–39)
Whitney, Mt. (hwĭt′nĭ), 158, (154–155)
Wichita [Kan.] (wĭch′ĭ-tô), 79, (74–75)
Wichita Falls [Texas], 114, (102–103)
Wilkes-Barre [Pa.] (wĭlks′-băr′ĭ), 32, (38–39)
Willamette River (wĭ-lăm′ĕt), 153, 157, (154–155)
Wilmington [Del.] (wĭl′mĭng-tŭn), 29, (38–39)
Winds, 232–234, (232, **234**); relations to rain, 234–235, (237, 239)
Wines, France, 315; Germany, 325; Italy, 367; Spain and Portugal, 363
Winnipeg [Manitoba] (wĭn′ĭ-pĕg), 175, 187, (182–183)
Winston-Salem [N. C.] (wĭn′stŭn-sā′lĕm), 94, 118, (102–103)
Winter wheat, 66, 68
Wisconsin (wĭs-kŏn′sĭn), 62, 72, 84, 92, (74–75)
Wood, use and sources of, 35; work in, in Germany, 325
Wood alcohol, 221
Wood carving, Japan, 422; Switzerland, 335
Wood pulp, 35; Alaska, 168; Canada, 179, 187; Germany, 325; Newfoundland, 188; North Central States, 92; Norway and Sweden, 346
Wool, Australia, 440, 442; Bolivia, 262; British Isles, 290; countries leading in production, 469, 470; New Zealand, 445; Spain and Portugal, 364; Western States, 147
Woolen manufacturing, Alsace-Lorraine, 313; Belgium, 341; France, 308; Great Britain, 291–293; India, 402; Italy, 371; New England, 45–46
Worcester [England] (wo͝os′tĕr), 291, (482–483)
World War, 50, 186, 257–258, 288, 298, 337, 338, 340, 394, 452, 460; effects in France, 307–310; effects in Italy, 373; Germany and the, 318, 325–328; results to Russia, 355–358; Switzerland during, 331; Turkish losses, 381
Wrought iron, 41
Wyoming (wī-ō′mĭng; wī′ō-mĭng), 114, 129, 137, 146, 147, 163, (154–155)

Y

Yakima Valley (yăk′ĭ-mȧ), 141, 142, (154–155)
Yaks (yăks), 410
Yams (yămz), 462, 463
Yangtze River (yäng′tsĕ), 413, 417, (411)
Yellow River, 413, (411)
Yellowstone Lake (yĕl′ô-stōn′), 163, (154–155)
Yellowstone Park, 162–164, (154–155)
Yellowstone River, 163–164, (154–155)
Yemen (yĕm′ĕn), 388, (385, **391**)
Yokohama [Japan] (yō′kō-hä′mȧ), 422, 423, 424, 473, (**411,** 422)
Yonkers [N. Y.] (yŏn′kērz), 47, (38–39)
Yosemite National Park (yō-sĕm′ĭ-tē), 163, 165, (154–155)
Yosemite Valley, 164, 165, (154–155)
Youngstown [Ohio] (yŭngz′toun), 89, (74–75)
Ypres [Belgium] (ē′pr'), 341, (482–483)
Yuba River (yo͞o′bȧ), 151
Yucatan (yo͞o′kä-tän′), 190, 191, 197, 199, (194–195)
Yugoslavia (yo͞o′gō-slä′vĭ-ȧ), 373, 374, 380, (281, **369**)
Yukon River (yo͞o′kŏn), 169, 171, (182–183)
Yukon Territory, 175, (182–183)

Z

Zambezi River (zăm-bē′zĭ; zȧm-bā′zē), 452, 456, (451)
Zanzibar (zăn′zĭ-bär′; zăn′zĭ-bär′), 456, (451)
Zealand Island (zē′lănd), 344, (300–301)
Zeehan (zē′ăn), 443, (439)
Zinc, 4; Andean countries, 262; Australia, 443; China, 412; Germany, 323; Malay Peninsula, 427; Norway and Sweden, 347; Northern and Southern Rhodesia, 457; Russia, 353; Spain and Portugal, 363; United States, 82, 149, (133)
Zones of the earth, 226–227, (227)
Zurich [Switzerland] (zo͞o′rĭk), 288, 331, 336, (300–301)

This book belongs to
Mrs. Dorothy Rodrigues
If lost return To
Mrs. Dorothy Rodrigues
138 Woodward Ave.
East Prov. 14, R.I.

E. Prov. 1-6915